Coniferæ, Engelm. p. 330
Cenotheræ, by Engelm & Gray p. 332

Revision of Castilleia by Gray p. 335
——— Mertensia — — 339

Parry's

Rocky Mountain

Plants

coll. 1861

by A Gray in

vol. 33 & 34

Lit Journ 1862

Parry, Hall & Harbour's

Rocky Mountain plants

coll. 1862 by A Gray

Proceedings Acad. Nat. Sc. Philadelphia

March 1863

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PHYSIOGRAPHICAL SKETCH

OF THAT PORTION OF THE

ROCKY MOUNTAIN RANGE,

AT THE HEAD WATERS OF SOUTH CLEAR CREEK, AND EAST OF MIDDLE PARK: WITH AN ENUMERATION OF THE PLANTS COLLECTED IN THIS DISTRICT IN THE SUMMER MONTHS OF 1861.

BY

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[From the American Journal of Science and Arts, Vol. XXXIII, 1862.]

Silliman. XXXIII. p. 231

PHYSIOGRAPHICAL SKETCH, &c.

WITH the exception of a few isolated peaks and elevated ridges in connection with the Appalachian mountain range, in no instance reaching an elevation of 7000 feet above the sea level, the truly alpine vegetation of the North American continent is confined to the remote region of the Rocky mountains. Here alone, within temperate latitudes, do we meet with mountain ranges where the summer sun is reflected from snowy wastes, and in which occur peaks attaining an elevation of over 12,000 feet.

Our previous knowledge of the general external features and peculiar vegetation of this alpine district, has been derived from the researches of various explorers, who have traveled hastily over this heretofore inhospitable region, noting the most prominent features of scenery along the ordinary routes of travel, determining the latitude and longitude of various fixed points, mapping out the direction of water-courses, sketching in the more prominent mountain ranges, and rarely, (as in the case of James, Douglas, Drummond, Nuttall, and Fremont,) making collections of its plants. From all these different sources of information, extending through the present century, we have derived a considerable though still imperfect knowledge of the peculiar natural features of our American Switzerland.

Within the past few years, however, the discovery of gold deposits in this portion of the mountain range has attracted thither an adventurous and enterprising population, settling with wonderful celerity its picturesque valleys and introducing into its wild recesses many of the arts and comforts of civilized life. These various social movements have afforded facilities for the prosecution of researches in natural history which were not enjoyed by the early pioneer explorers of this region.

In order to improve this opportunity, the writer was induced to make a journey to this region during the past season, (1861,) with the especial object of studying its alpine vegetation and making collections of its native plants. With this view a station was selected near the foot of the dividing ridge, at the head waters of South Clear Creek. From this point an extensive scope of alpine exposure was brought within the range of an ordinary day's journey. Here, among the pine-wooded slopes on both sides of the Snowy Range, coursing along its alpine

brooks, clambering over its precipitous rocks, floundering through snow-drifts, and mounting to its irregular crests and high alpine peaks, was spent most of the summer months of 1861. The scientific results of the observations here made, are presented in the following brief sketch and the accompanying list of plants.

The first impression made upon the traveller in approaching the mountain barrier from the broad undulating slope of the Great Plains, is the irregularity of outline and apparent want of system in the grouping and arrangement of the different ridges which compose the general mass of the mountain range. Some of the higher peaks rear their snowy summits at considerable distances from the dividing crest, and are met with at irregular points along the eastern slope. Numerous cross ridges interrupt the general parallelism of the principal ranges, and the actual "divide" is mostly obscured from view by elevated projecting spurs. The streams with their impetuous currents foaming along their rocky channels descend in a zigzag course, making their passage through intervening ridges by deep precipitous chasms. On reaching the more elevated mountain district, the valleys become more open, and frequently spread out into oval-shaped basins, to which the name of *bars* has been applied by the miners. Towards the head waters of the various streams, these basin-shaped portions of the principal valleys, beset with scattering groves of pine, encircled by steep ridges, generally clothed with heavy growths of spruce or exhibiting occasionally smooth grassy slopes, are known as *parks*. These are the miniature representatives of those larger open stretches of country which occur at the head waters of the Platte and Grand rivers, forming North, South, and Middle Parks.

In approaching the dividing ridge, by following up any of the principal streams by which the mountain range is penetrated, the open parks give place to narrow valleys, generally heavily timbered with pine and spruce. The water-courses force their way through narrow rocky *cañons*, or, obstructed by beaver dams, spread out into marshes occupied by a tangled growth of willow and alder bushes.

The smaller tributaries which collect the waters that trickle from alpine snows ebb and flow with the diurnal changes of temperature, increasing in volume as the sun ascends to relax the icy bonds of a protracted winter, and again contracting as the clear night once more asserts the reign of perpetual frost. These alpine brooks constitute one of the most attractive features of Rocky mountain scenery, and along their borders grow some of the finest plants of this region. Their course is that of a continuous *torrent*, presenting in their rapid descent a perpetual sheet of foam, rivalling in whiteness the snows in which they have their sources. Their waters of crystal purity and delicious

coolness glisten in the deep shade of overhanging pines, and moisten with their spray such choice plants as *Mertensia Sibirica*, *Cardamine cordifolia*, *Saxifraga æstivalis*, and a most elegant and conspicuous *Primula* (311) near *P. nivalis*.

In mounting up the steep ridges which border their course, to reach their alpine sources, the view of the surrounding country is entirely shut in by the heavy growth of pines, including on the higher ridges and abrupt slopes, *Pinus contorta* with its slender tapering trunk and stiff scanty foliage; while on more level spots, or occupying depressed basins forming sub-alpine marshes, *Abies alba* and *Abies balsamea* shoot up their tapering spires. The usual undergrowth in these pine woods is composed of *Vaccinium Myrtillus*, *Shepherdia argentea*, *Berberis Aquifolium*, *Pachystima Myrsinites*, &c.

In moist springy places and along the borders of marshes we find *Gaultheria Myrsinites*, *Pedicularis surrecta*, *Senecio triangularis*, *Mitella pentandra*, *Habenaria dilatata*, *Pyrola rotundifolia*, var. *uligmosa*, &c. As a rarity, in scattered localities, we here meet with the charming *Calypso borealis*.

On approaching the limits of arborescent growth, indicated at first by a stunted appearance of the common varieties of pine, as well as the more frequent occurrence of the alpine species, *Pinus flexilis*, we at length come somewhat abruptly upon open stretches, characterized by their peculiar vegetation and general aspect as truly alpine. Some few trees straggle for a variable distance up the abrupt rocky slopes, but in these situations they plainly exhibit the severity of the exposure by deformed and blasted trunks, often nearly prostrate, and showing by a uniform bending of their upper branches the direction of prevailing fierce winds, and the weight of wintry snows. These arctic forms are confined almost exclusively to a single species of pine, heretofore undescribed, (*Pinus aristata*, Engelm.) belonging to the same group as *Pinus flexilis*, James.

Beyond this there is a succession of alpine exposures, characterized by extensive patches of snow scattered irregularly over the mountain slopes, generally indicating the accumulation of drifts; being most abundant and persistent in recesses near the higher elevations. At other points a rough *talus* of rocks is spread over the surface, the separate blocks being of every conceivable shape, and loosely aggregated, forming numerous fissures. In these burrowing recesses the Siberian squirrel finds a congenial abode, and salutes the traveller with his reiterated bark, often the only animate sound to break the solitude of these alpine deserts. Through these loose masses quarried out by nature's hand, we often hear beneath our feet the gurgling of invisible streams, connecting by these subterranean channels elevated snow-banks with lower alpine brooks. Among these

rock crevices we meet with many of the rare and attractive plants of this district, including *Aquilegia brevistyla*, *Viola biflora*, a variety of *Ribes lacustre*, *Senecio Fremontii*, *Oxyria reniformis*, *Polygonum Bistorta*, &c.

Other portions of these mountain slopes are covered with a sward of alpine grasses, mingled with *Carices* and mountain clovers, all characterized by their peculiar tough, matted, and penetrating roots. In connection with these, almost every square yard presents a botanical feast of the most attractive and varied features. Neat little tufted plants of the most cerulean blue, including *Polemonium pulcherrimum*, *Mertensia alpina*, *Myostis nana*, Torr., (*Eritrichium aretioides ?*) spot the surface. In scattered localities the bright yellow disk of *Actinella grandiflora* is conspicuous, while the varieties of alpine *Phlox*, *Primula angustifolia*, *Trifolium Parryii*, &c., supply almost every tint to complete a floral rainbow. Here also by a close inspection we discover such tiny plants as *Thalictrum alpinum*, *Gentiana prostrata*, and others almost hidden in the confused mass of matted foliage. In moist depressed places, and along the spongy margins of alpine lakes, we meet constantly with an alpine *Salix*, *Caltha leptosepala*, and a white *Trollius* near *Americanus*.

Toward the summit of the dividing ridge we find plants whose names plainly indicate the frigid climate to which they belong. Here grows the elegant flowered *Claytonia* which I have called *megarhiza*, sending its deep tap-roots into the crevices of rocks whose projecting angles shelter its succulent foliage from the rude blasts that sweep over these bald exposures. Affecting similar situations we meet with an alpine *Synthyris*, (255,) with its glossy foliage and neat spike of pale blue flowers.

On the summit of the crest, which here presents a flattened irregular surface, composed of weather-worn rocks imbedded in the coarse *debris* of its disintegrating granitic masses, we find *Trifolium nanum*, *Stenotus pygmæus*, *Papaver nudicaule*, *Saxifraga serpyllifolia*, *Gentiana frigida*, and others, all indicative of a rigorous climate, whose brief summer is thus elegantly adorned by these arctic forms of vegetation. Among the rarities of this district we may notice the newly discovered [or re-discovered] *Chionophila*, (256,) *Pedicularis Sudetica*, and several others well known in the Old World, but now for the first time added to the North American flora.

Such is a general and very imperfect sketch of the prominent features of the vegetation belonging to this elevated district, taking for a sample the alpine ridge at the head waters of *Mad Creek*, to which from my frequent visits I involuntarily applied the name of *Mount Flora*.

In my solitary wanderings over these rugged rocks and through these alpine meadows, resting at noon-day in some sunny nook,

overlooking wastes of snow and crystal lakes girdled with mid-summer ice, I naturally associated some of the more prominent mountain peaks with distant and valued friends. To two twin peaks always conspicuous whenever a sufficient elevation was attained, I applied the names of *Torrey* and *Gray;* to an associated peak, a little less elevated but in other respects quite as remarkable in its peculiar situation and alpine features, I applied the name of *Mount Engelmann.* Thus following the example of the early and intrepid botanical explorer, Douglas, I have endeavored to commemorate the joint scientific services of our *triad* of North American botanists by giving their honored names to three snow-capped peaks in the Rocky mountains. With such innocent scientific pleasantry I felt at liberty to amuse the solitary hours of my mountain excursions, often wearied, but always enjoying with the keenest zest the magnificent scenery and rich botanical treasures that lay scattered along my varied path.

No description indeed can do justice to the grand features of scenery brought to view from the elevated points and commanding crests of this broad mountain range. While to the east the comparatively level plain stretches out like a boundless sea, in every other direction rise elevated peaks and snow-girt ridges, hemming in deeply sheltered valleys. An obscure parallelism of the principal ridges is here for the first time noticeable, more evidently marked however by the occurrence of culminating points forming broken lines extending northwest and southeast than by any continuity of the principal ridges. The *water-shed* itself is a very irregular line, difficult to trace with the eye even from the most elevated points. This is owing to a very marked peculiarity of the range which exhibits the higher culminating points disposed quite constantly on the eastern slope of the divide, with which they are generally connected by depressed spurs. It is from these offsetting peaks that the most comprehensive views are obtained, and the general topography of the range can be best studied.

It may be noticed also that the most feasible *passes*, over the Snowy Range, are met with where the dividing ridge is inclined to an east and west course. In such situations the streams flowing thence north and south, respectively have their sources in the most depressed portions of the range, usually only a short distance apart.

In such a position, near the head waters of South Clear Creek is found the depression known as *Berthoud's Pass*, discovered by an Engineer of that name, while engaged in making a reconnoisance, for the location of a direct road from Denver to Salt Lake. In this pass the elevation at the highest point does not reach above the limits of arborescent growth, the dividing waters on either side heading but a few feet apart, in a pine grove.

Farther observation will be required, to show how far the accumulated snows of winter may offer obstructions to a through route, accessible at all seasons. The practical difficulties interposed by the steep ascent of the main abrupt slope can no doubt be readily overcome, by the construction of embankments and zigzags. When the principal height is once gained, farther progress is easy in either direction, by the usual appliances of road construction, for which the proper materials of stone and lumber are abundant, and of excellent quality.

The westward view takes in that irregular scope of country, including Middle Park, with its broad open spaces, encircled by broken ranges of mountains.

These mountains send down into the plain below, numerous spurs, heavily timbered with a magnificent growth of spruce, (*Abies alba*). Between these ridges, deeply sheltered valleys collect the tributary streams, forming the head waters of Grand River. The projecting mountain peaks on this side do not attain the height of those met with on the eastern slope, but the general surface is more elevated; the lowest depressions, occurring in the basin of *Middle Park*, being considerably higher than corresponding points on the great plains to the eastward. Hence the streams are less rapid, and the vegetation indicates a colder and more humid climate.

Here during the rainy season, in the months of July, and August, the different surface exposures give rise to variable atmospheric currents, which, meeting at various points, occasion a rapid development of clouds and aqueous precipitation, such as characterizes the sudden showers in this peculiar district. Here in fact may be studied to the best advantage, (though not always under agreeable circumstances), the formation of clouds, in their endless variety of shape, density, and progressive development. These at times may be seen gradually accumulating about the summits of snow covered peaks, thence spreading over the horizon and extending to the zenith, causing a regular steady rain; while at other times a sudden gust calls attention to a rapidly forming angry cloud, which sweeps over the surface in a well defined path, scattering rain, hail, or snow in its wake.

The regular afternoon showers which occur on the eastern slope are readily explained by referring them to the junction of heated air, charged with moisture, ascending from the great plains, with the descending currents of cold air from the snowy range, by which the moisture of the former is precipitated. As soon as the equilibrium is established, the rain passes off, and a sky more or less clear succeeds, followed almost invariably by clear nights and bright mornings. This series of phenomena, often succeeding with remarkable regularity from one day to

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another, continues during the months of July and August, constituting a rainy season.

The principal object of my journey being the collection of plants, I may here very properly conclude this sketch of the general features of scenery, and climate.

The accompanying list of plants prepared from my collections, and notes, by Prof. Gray and Dr. Engelmann, will serve to give a more precise view of the botany of this region, particularly of the alpine district, to which my attention was specially directed.

Travelling over a path so ably investigated by early explorers, I have still been rewarded for my labors by the discovery of several interesting novelties, as well as by adding quite a number of alpine plants, well known in the Old World, to our North American Flora.

Should circumstances prove favorable, it is the intention of the writer to continue these observations during the coming season, over a wider section of country lying to the west and south of the investigations of the past season.

Enumeration of the Plants; by A. GRAY, *aided by notes of Drs.* ENGELMANN *and* TORREY, *and upon the habitats, &c., by Dr.* PARRY.

[The numbers are those under which the specimens have been distributed. Their order is followed, excepting a few transpositions to bring allied species together, when it could conveniently be done.]

1. *Erigeron grandiflorum*, Hook. Fl. Bor.-Am., t. 123; var. *elatius*. "In moist shady places, near the upper limit of the arborescent growth. Rays tinged with pink or purple." The specimens (a span to a foot in height) are considerably taller than Drummond's plant, from the summit of the Rocky Mountains much farther north, and the cauline leaves more clasping. Its affinities are with our American species of the section *Stenactis* on the one hand, and with the following species on the other, notably with the form named *E. alpinum* var. *eriocalyx* by Ledebour from the Altai.

8. *Erigeron uniflorum*, L., the true, with black-woolly involucre, like Bourgeau's specimens from the snowy region of the Rocky Mountains farther north. "Near the base of the bare alpine ridges."

3. Varieties of the last (one with blue, the other with nearly white rays), far less pubescent.

4. *Erigeron macranthum*, Nutt.

5, 6, 11, 33. *Erigeron compositum*, Pursh; different forms; the last smoothish and the same as *E. pedatum*, Nutt. No. 5 is a var. *discoideum*, wholly destitute of rays. Drummond long ago gathered specimens with very short rays. No. 33, is a single specimen of the same discoid variety.

7. *Erigeron acre*, L., var. Just the *E. Dræbachensis* of the Flora Danica, which we have from Labrador.

9. *Erigeron Bellidiastrum*, Nutt. A plant of the plains.

10. *Arnica angustifolia*, Vahl., var. *discoidea! latifolia.* There is a discoid species in California; but none of the common species have before been met with in this condition.

2. *Arnica cordifolia*, Hook.

12. *Boltonia latisquama* (sp. nov.): foliis lineari-lanceolatis et magnitudine capitulorum inter *B. glastifoliam* et *diffusam* media; squamis involucri spathulatis vel obovatis nervo crasso excurrente mucronatis vel cuspidatis; pappo pluri-squamellato et 1–2-aristato. "Near the mouth of the Kansas river, Sept.; growing in large clumps, 3 to 5 feet high, in rich soil." Well marked by the broad and rounded, abruptly tipped scales of the involucre.

13. *Aster* (*Orthomeris*) *glaucus*, Torr. & Gray, (*Eucephalus glaucus*, Nutt.) Abundant and very fine specimens of a rare and interesting plant, by aid of which the species should be characterized anew.*

14. *Machæranthera* (*Dïeteria*) *canescens*, Gray, Pl. Wright.

15. *Solidago Missouriensis*, Nutt., a dwarf, subalpine variety.

17. Another dwarf variety of the above species.

16. *Solidago humilis*, β, Torr. & Gray; to be restored to *S. Virgaurea.*

18. The var. *alpina* of the above (i. e. *S. Virgaurea, alpina*, Bigelow), resembling the plant from the summit of the White Mountains, New Hampshire, but only an inch or two high.

19. *Senecio aureus*, var. *Balsamitæ*, with leaves more pinnatifid.

20. *Senecio canus*, Hook., with few and large heads.

22. The same species with more numerous and smaller heads.

21. *Senecio lugens*, Richards., but the scales of the involucre not at all sphacelate at the tip.

23. *Senecio exaltatus*, Nutt., var. *minor.* A form of *S. lugens.*

24. *Senecio integerrimus*, Nutt. A rare species.

25. *Senecio triangularis*, Hook., in beautiful specimens.

26. *Senecio eremophilus*, Richards.

27. *Senecio Fremontii*, Torr. & Gray. Taller and well developed specimens of this alpine species, mostly a foot high.

28. A low, apparently more alpine variety of the preceding, with monocephalous stems, and leaves all tapering at the base.

29. *Palafoxia Hookeriana*, Torr. & Gray.

30. *Aplopappus spinulosus*, DC.

31. *Coreopsis involucrata*, Nutt. This, with the two preceding, and a specimen of *Pectis angustifolia*, Torr., were gathered on the plains.

32. *Arnica angustifolia*, Vahl; the tall, leafy-stemmed form common in that region, and approaching *A. Chamissonis.* Bourgeau collected the same on the Saskatchawan.

33, 35. *Townsendia sericea*, Hook.

34. *Cirsium edule*, Nutt.? "A common subalpine species, 3 to 6 feet high; flowers yellowish."

Cirsium foliosum, DC., or a plant generally agreeing with Hooker's character, was sparingly collected in the bare alpine region.

36. *Euphrosyne xanthifolia*, Gray, Pl. Wright. *Cyclachæna xanthifolia*, Fresen.

* *Aster Engelmanni*, Gray, coll. H. Engelmann, in Exped. Lieut. Bryan, I believe still unpublished, is another fine species of this section. The same was collected by Dr. Lyall of the British Oregon Boundary Commission, in the Cascade Mountains.

37. *Antennaria dioica*, R. Br. 39. Var. *rosea* of the same.
38. *Antennaria Carpathica*, DC.
40. *Iva axillaris*, Pursh.
41. *Artemisia borealis*, Pall.
42. *Artemisia Richardsoniana*, Bess. A form with looser pubescence and acute lobes to the leaves.
43. *Artemisia frigida*, Willd.
44. *Artemisia filifolia*, Torr. From the region where Dr. James first collected it.
45. *Artemisia Canadensis*, Michx.; a canescent form.
46. *Actinella aculis*, Nutt. Probably *Actinea integrifolia*, Torr.
47, 60. *Aplopappus* (*Stenotas*) *pygmæus*. *Stenotus pygmæus*, Torr. & Gray, Fl. 2, p. 237. "Found only on the highest crests of the snowy range, and on the dividing ridge, growing in scattered patches." A most interesting rediscovery of a plant before known only from a single specimen, gathered by Dr. James during his hurried visit to the alpine region, in Long's Expedition.
48. *Grindelia squarrosa*, Dunal.
49. *Limosyris viscidiflora*, var. γ. *L. ciliata*, Torr. &c.
50. *Helianthus* (*pumilus*, Nutt.?): caule 1–3-pedali hispido oligocephalo; foliis oppositis ovato-lanceolatis subintegerrimis cinereo-hispidis (novellis resinoso-atomiferis) juxta basin triplinerviis breviter petiolatis, summis lanceolatis subsessilibus sæpe alternis; involucri disco paullo brevioris squamis oblongis exappendiculatis obtusiusculis vel breviter acutatis extus albo-villosis; fl. disci luteis; acheniis glabris versus apicem parce hispido-ciliatis; pappi paleis subulatis corolla paullo brevoribus cum paleolis interpositis extus marginibusque appresse hispidis. "On a rocky hill bordering the upper Clear Creek." Dr. Hayden also collected it on the Laramie Mountains. His specimens, being too far advanced, I had confounded with *H. rigidus;* but the plant is nearer *H. lætiflorus.* If it is not Nuttall's obscure *H. pumilus* it must be a new species. The latter is said to have the heads "apparently sessile," from which it may be inferred that they were not well developed in Nuttall's specimen. In ours they are on slender peduncles.
57. *Helianthus orgyalis*, DC. This seldom occurs in collections.
51. *Aplopappus* (*Pyrrocoma*) *Parryi* (sp. nov.): caule pedali superne subviscoso-puberulo apice corymboso-polycephalo, pedunculis brevissimis; foliis submembranaceis fere glabris angusto-oblongis obtusis integerrimis, inferioribus subspathulatis in petiolum attenuatis, summis basi latiore subamplexicaulibus; involucri campanulati squamis lato-lanceolatis tenuiter coriaceis apice subfoliaceo laxo; ligulis plurimis parvis; acheniis glaberrimis; pappo albo haud rigido. "Hillsides and pine woods, upper Clear Creek." A well-marked species, with somewhat the aspect of a *Sericocarpus*, especially of *S. Oregonensis;* heads half an inch long; the rays 15–20, yellow, narrowly linear, but little longer than the disk-flowers. Pappus white in the flowering specimens (unknown in the mature state) nearly equalling the disk-corollas. "These specimens grew in the shade; in open ground the leaves are not so thin."
52. *Senecio cernuus* (sp. nov.): mox glaber; caule gracili sesquipedali apice paniculato-polycephalo; foliis lanceolatis basi in petiolum

marginatum subciliatum longe attenuatis parce argutissime dentatis vel subintegerrimis; capitulis parvulis (vix semi-pollicaribus) in pedicello 1–2-bracteolato nutantibus discoideis; involucro bracteolis parcis laxis subcalyculato; ovariis glaberrimis. "Dry hillsides, and in the crevices of rocks, upper part of Clear Creek, sometimes growing in close bunches." A species entirely new to me, well marked by its small nodding or cernuous heads, and its leaves (either broadly or narrowly lanceolate) tapering into wing-margined petioles of an inch or two in length. No ray flowers; those of the disk yellow.

53. *Arnica mollis*, Hook.? a dwarf form.

54. *Arnica angustifolia*, Vahl; the alpine form, as of the Rocky Mountains farther north, and of the N. W. coast.

55. *Chænactis achilleæfolia*, Hook. & Arn.

56. *Senecio amplectens*, (sp. nov.): lana parca mox decidua glabratus; caule (sesquipedali e radice perenni) apice nudo 1–2-cephalo; foliis membranaceis repando-subdentatis oblongis plerumque obtusissimis, radicalibus in petiolum alatum decurrentibus, caulinis præsertim superioribus e basi lata (integerrima vel utrinque 1–2-dentata nunc subhastata) semiamplexicaulibus; pedunculo gracili; involucro calyculato pilis brevibus atropurpureis parcis munitis; ligulis elongatis linearibus aureis apice sæpius 2–3-fidis; acheniis glaberrimis. "In the mountains high up, at the foot of the snowy range." This is quite distinct from any North American species known to me. Compared with *S. frigidus*, it is far less woolly, even when young, and not at all hairy, except some purple hairiness of the involucre; the latter is calyculate with linear scales of about one-third the length of the proper involucral scales; and the thin and green leaves are from 3 to 5 inches long, the cauline ones half clasping or more by a broad base, not at all inclined to be spatulate. Head nearly as large as in *S. frigidus*, the rays longer, an inch or more in length. Pappus equalling the disk-flowers.

58. *Villanova chrysanthemoides*, Gray, Pl. Wright; a more pubescent form.

59. *Chrysopsis villosa*, Nutt., var. approaching *hispida*, *mollis*, &c., all probably forms of *C. villosa*.

61. *Actinella grandiflora*, Torr. & Gray in Bost. Jour. Nat. Hist. Soc., 5. "Scattered over the alpine ridges, growing singly or branched from a deep tap root, 6 to 9 inches high." A most splendid dwarf alpine plant, which, having caused seeds to germinate, I hope to introduce into the gardens. The heads, with their numerous rays fully expanded, are nearly 3 inches in diameter, and bright yellow. It was before known only by the single specimen gathered by Fremont, in Dr. Torrey's herbarium.

62. *Gaillairdia aristata*, Pursh.

63. *Senecio aureus*, L., var. *alpinus:* caule scapiformi 1–2-cephalo tri-pollicari bracteato; foliis radicalibus coriaceis rotundatis seu obovato-oblongis fere aveniis integerrimis vel apice subtridentatis. This doubtless was collected near the snow line. I believe it is an alpine and extremely reduced form of *S. aureus*, var. *borealis*, and that *S. subnudus*, DC., may also be reduced to *S. aureus*.

64, 66. *Macrorhynchus troximoides*, Torr. & Gray; broad-leaved and narrow leaved.

65. *Troximon glaucum*, Nutt., var. foliis laciniatis.

67. *Troximon parviflorum*, Nutt. Probably a depauperate form of the last.

68. *Lygodesmia juncea*, Don.

69. *Crepis runcinata*, Torr. & Gray.

71. *Hieracium Fendleri*, Schultz Bip. in Bonpl. 1861, p. 174. *Crepis ambigua*, Gray, Pl. Fendl.

72. *Hieracium triste*, Willd.

73. *Mulgedium pulchellum*, Nutt.

74. *Atragene alpina*, L.: the same as Fendler's, i. e. var. *Ochotensis*.

75. *Thalictrum alpinum*, L. Very rare as an American plant, found before only on the eastern borders of this continent, Anticosti, &c.

76. *Thalictrum sparsiflorum*, Turcz.; vide Gray, Pl. Wright, adn. p. 8: forma ovariis breviter stipitatis unacum pagina inferiori foliorum resinoso-atomiferis. Maximovicz, commenting in the Flora Amurensis upon my identification of *T. clavatum*, Hook. (non DC.) with *T. sparsiflorum*, indicates a difference between the American and the Siberian plant in the length of the filaments and of the stipe. The latter is variable; the former is subsexual; both short and long filaments occur in Richardson's specimens. I am able to compare the fruit of a Hudson's Bay specimen with that of one of Tilings, of the Fl. Ajanensis, and to pronounce them precisely alike. In the latter the leaves are resinous-atomiferous underneath, as they are in Dr. Parry's specimens, in which similar atoms thickly beset the carpels. The oval sepals appear to be white. *T. Fendleri*, Engelm., from the mountain region farther south is really much allied to this; but that has dioecious instead of hermaphrodite flowers, linear and conspicuously pointed instead of barely oblong anthers, the achenia oblique (instead of dimidiate) and sharp-edged, the ribs straighter and stronger.

77. *Ranunculus affinis*, R. Br.

78. *Ranunculus Cymbalaria*, Pursh.

79. *Ranunculus glaberrimus*, Hook.; var. foliis omnibus integerrimis, radice magis fibrosa. Mr. Spalding's specimens from the interior of Oregon connect this with Hooker's species.

80. *Ranunculus Eschscholtzii*, Hook. (an Schlecht.?) But perhaps an alpine form of No. 77. Some specimens under this number, with finely-cut leaves tend to confirm this suggestion.

81. *Ranunculus amœnus*, Ledeb.? I have before seen no American Ranunculus like this. It accords well with an authentic specimen of *R. amœnus*, but not so well with Ledebour's figure. This species has been joined by Ledebour himself to *R. affinis*, to which I should never think of referring our plant, with its large and very broad, overlapping petals. The fruit was not collected. It grows "in the high alpine region, in scattered patches near snow-banks: fl. June."

82. *Clematis Douglasii*, Hook.

83. *Trollius laxus*, Salisb., var. *albiflorus*. *T. Americanus*, Hook. Fl. Bor.-Am. "In moist or marshy places below snow-banks, associated with No. 91, June 21. Stem 6 to 12 inches high. Flowers white: these often frozen to a crisp recover perfectly in bright sunshine." The

pure white and broader sepals, lower stature, and alpine station, distinguish this from the ordinary form of the Northern United States. Regel in Fl. Ajan., reduces all the proposed species of this group to three, with many varieties, some of them too closely connecting *T. patulus* with the American species.

84. *Delphinium elatum*, L., a species which doubtless includes *D. intermedium*, *palmatifidum*, *flexuosum*, *villosum*, and *cuneatum*, DC. Also, I suppose, in part *D. exaltatum*, Hook. Fl. Bor.-Am., being more like that species than the next is; but it is not the plant of our Alleghany region. Like most of the present collection, the specimens are particularly good and neatly prepared. "It grows in large patches, on the moist borders of alpine brooks, near the limit of arborescent growth. Stem 3 to 5 feet high, the flowers vivid blue-purple."

85. *Delphinium scopulorum*, Gray, Pl. Wright. This is the same as one of Bourgeau's collection from the Saskatchawan, distributed as *D. exaltatum*. The spurs on the *lower* petals appear to be constant.

86. *Aconitum nasutum*, Fisch. (*A. Columbianum*, Nutt.) "Two very distinct varieties, one, 1½ to 3 feet high with greenish white flowers, growing in shady places along the borders of streams; the other with deep blue flowers, in more open places, not so tall, and inclined to twine about adjacent bushes."

87. *Anemone multifida*, DC., with both red and white flowers.

88. *Pulsatilla Nuttalliana*, Gray.

89. *Aquilegia cærulea*, Torr. Most beautiful specimens, from the district where Dr. James discovered this striking species. Limb of the petals apparently white, contrasting with the purple-blue sepals: spurs 2 inches long.

90. *Aquilegia vulgaris*, L., var. *A. brevistyla*, Hook. In the high alpine region.

91. *Caltha leptosepala*, DC. Borders of alpine brooks, with No. 84, &c.

92. *Thlaspi cochleariforme*, DC.? Hook., *T. Fendleri*, Gray, Pl. Wright. Although the silicle is less winged than in Delessert's figure, it is likely that the plant of the Rocky Mountains is not distinct from the Siberian; but I have not yet seen the evidence to justify its combination, as Dr. Hooker proposes, with *T. montanum* and *T. præcox* as well as with *T. alpestre*.

93. *Draba Johannis*, Host. (*D. nivalis*, DC.) Probably to be included among the forms reduced to *D. hirta* in the Fl. Ajanensis and elsewhere. In the high alpine region.

94. *Turritis patula*, Graham.

95. *Erysimum pumilum*, Nutt.; but the stigma is two-lobed or emarginate. "In the alpine region, low; flowers light sulphur-yellow." This may really be identical with Gaudin's *E. pumilum*, of the Swiss Alps, and it has equally a slender style and erect siliques. But it appears to pass into our *E. asperum* just as *E. pumilum* does into *E. Cheiranthus*. Not a single species of this group of *Erysimum* is well defined.

96. *Draba streptocarpa* (sp. nov.): radice § Holargis more bienni vel subperenni rosulam amplam caulesque floridos foliatos (spithamæos) proferente; foliis integerrimis setis simplicibus et bifurcatis villoso-hispidis, radicalibus spathulato-lanceolatis acutiusculis in petiolum marginatum longe attenuatis, caulinis sessilibus; racemis sæpe paniculatis; pet-

alis aureis calyce duplo longioribus; siliculis linearibus (vel imperfectis oblongo seu ovato-lanceolatis) hispidulo-ciliatis cæterum glabris, maturis eximie spiraliter tortis; stylo longo.—Forma vero *alpina* bipollicaris, siliculis (immaturis) brevioribus. "On rocky cliffs bordering the upper Clear Creek, extending into the high alpine region, where the dwarf form was found in flower in July, while the larger form lower down was mostly with ripe fruit." A most interesting species, allied to *D. aurea*, and with similar bright yellow, mostly retuse or emarginate petals. The leaves appear as if veinless, except the strong midrib, are all entire, and are beset, and especially ciliate, with long and rigid, shaggy, spreading, simple or simply forked hairs, far more bristly than in *D. aurea*, and with no fine stellular pubescence intermixed. Leaves of the radical clusters $\frac{3}{4}$ to $1\frac{1}{2}$ inches long; the cauline ones half an inch or so in length, oblong or oblong-lanceolate, the upper ones on their upper face, like the upper part of the stem, sometimes becoming glabrous. Racemes many-flowered. Style a little shorter than the ovary; stigma emarginate-capitate. Fructiferous pedicels 3 lines long, more or less spreading. Silicles when well developed from half to two thirds of an inch long, either minutely or strongly hispid-ciliate, and twisted like an auger, the turns 3 or 4; but many of them, especially the later ones, are shorter and with only one or two twists: the style $1\frac{1}{2}$ to nearly 2 lines long.

103. *Draba aurea*, Vahl, Hook. A form with smaller and narrower leaves than in Hooker's figure, and with simple elongated racemes. It accords very well with the plant cultivated several years ago under this name in Kew Gardens, and has a similar (at most biennial) root. *Draba* No. 6, of Bourgeau in Paliser's Expedition, is apparently the same; while Burke gathered in the Rocky Mountains specimens agreeing with Hooker's figure. All have a short and fine pubescence, and minutely hoary, plane or slightly twisted silicles, the style from a line to a line and a half in length. But, as in other Cruciferous plants, no great reliance can be placed on the length of the style. In New Mexican specimens, var. *stylosa* (*D. aurea*, Pl. Fendl., No. 43, p. 10, and in coll. Bigelow, Pacific R. R. Rep. iv, p. 66,—both ramose forms), the style is quite as long as in *D. streptocarpa*. I have seen no Greenland specimens.

Draba alpina, L.; a form apparently of this species, with one or two leaves on the scape, and a rather conspicuous style, was gathered on the summit of the snowy range.

97. *Draba nemorosa*, L.

98. *Arabis hirsuta*, Scop.

99. *Cardamine cordifolia*, Gray, Pl. Fendl.

100. *Sisymbrium canescens*, Nutt.

101. *Physaria didymocarpa*, Gray (*Vesicaria didymocarpa*, Hook.): var.? racemis fructiferis elongatis; siliculis minoribus corrugatis minus inflatis. "Dry gravelly bluffs of upper Clear Creek, growing in bunches a foot in diameter: the vegetation more luxuriant than *P. didymocarpa* of the plains, of which it is probably only a mountain variety." If so, it is a remarkable one. There is an unpublished species, *P. Newberryi*, allied to *P. Geyeri*, collected by Dr. Newberry in the interior of New Mexico.

102. *Erysimum asperum*, DC., the form with orange-colored flowers, *E. Arkansanum*, Nutt., collected on the plains.

SINCE the first part of this Enumeration was published, Dr. J. D. Hooker's most interesting memoir, entitled "Outlines of the Distribution of Arctic Plants," has been received. This is of great importance in the study of any alpine or subalpine collection like the present, and has given occasion to a few remarks in the following pages. The memoir itself I expect to give some account of hereafter.

No. 79. Mr. Black, the obliging Curator of the Hookerian Herbarium, calling my attention to this number, enables me to correct an obvious error in my naming, in the first part of this enumeration. The plant is not *Ranunculus glaberrimus*, Hook., but an abbreviated subalpine state of *R. alismæfolius*, Geyer (the same as No. 306 of his collection), to which Bentham refers the *R. Flammula* of American authors.

I am well satisfied to see that Dr. Hooker, in his important paper on the Distribution of Arctic Plants, reduces *R. Eschscholtzii* to *R. nivalis*, L. Some specimens of Parry's No. 80 probably belonged to *R. affinis*.

104. *Cleomella tenuifolia*, Torr., from the district in which Dr. James discovered this species, so long taken for the original *C. Mexicana*.

105. *Cleome integrifolia*, Torr. & Gray. The *C. serrulata* is probably a nonentity, or a mere variety of this.

106. *Viola biflora*, L. This arctic-alpine species of the Old World had been traced all the way round to N. Japan and Kamtschatka, but was not before known as American, unless perhaps recently to Dr. Hooker, who has recorded it in his Tabular View,—perhaps on Dr. Parry's specimens, which may have reached him in time; or perhaps Bourgeau may have met with the plant.

107. *Viola Muhlenbergii*, Torr.; with some pubescent specimens belonging to the next.

108. *Viola Muhlenbergii*, var. *pubescens*, passing into *V. adunca*, Smith (*V. longipes*, Nutt.); which, except in its longer (seldom crooked) spur, as closely answers to the *V. arenaria* and *pumila*, as the ordinary *V. Muhlenbergii* does to the *V. sylvatica*, of the Old World. *V. adunca* should therefore have been added to the synonyms adduced by Dr. Hooker, in bringing all of this group under *V. canina*. Parry's specimens answer well to Bourgeau's from Saskatchawan.

109. *Viola Nuttallii*, Pursh; from the plains.

110. *Viola palustris*, L. From the alpine region, apparently, and the true *palustris*. The plant of our White Mountains is rather *V. epipsila*, Ledeb. Dr. Hooker goes a step too far in referring our *V. blanda* (with its lanceolate sepals and white flowers) to *V. palustris*. Our difficulty is to keep *V. blanda* clear of *V. primulæfolia*, and that clear of *V. lanceolata*.

111. *Geranium Carolinianum*, L.

112. *Geranium Richardsonii*, Fisch. & Mey.: "var. stylis profundius divisis nudiusculis." Engelm.

113. *Geranium Fremontii*, Torr.: "var. *Parryi;* caulibus pedunculisque patenter glanduloso-villosis; foliis minus profunde incisis, laciniis ultimis dentibusve ovatis obtusiusculis." Engelm.—The deflorate pedicels are sometimes declined.

114. *Gaura coccinea*, Nutt.

115. *Œnothera lavandulæfolia*, Torr. & Gray.

116. *Œnothera albicaulis*, Nutt., with pinnatifid leaves.

117. The same with undivided leaves.

118. *Stenosiphon virgatus*, Spach.

119. *Epilobium tetragonum*, L. Just like Swedish specimens.

120. *Epilobium alpinum*, L. The same genuine form was gathered by Mr. H. Engelmann at Bridger's Pass.

121. *Epilobium alsinifolium*, Vill. The same as the larger form in the alpine region of the White Mountains of New Hampshire. Dr. Parry notes it as probably a form of the last, and so we have regarded it.

122. Nearly the same as No. 119, but nearly smooth.

123. *Epilobium latifolium*, L. Perhaps its most southern station.

125. *Epilobium paniculatum*, Nutt.

124. *Gayophytum ramosissimum*, Torr. & Gray.

126. *Mentzelia albicaulis*, Dougl.

127. *Mentzelia* (*Bartonia*, Nutt.) *nuda*, Torr. & Gray.

128. *Sedum Rhodiola*, L. The female plant. "Along the borders of alpine brooks."

129. *Sedum rhodanthum* (sp. nov.): floribus hermaphroditis plerisque tetrameris pedicello plus duplo longioribus; sepalis linearibus; petalis læte roseis lanceolatis sensim acuminatis stamina (oppositopetala eis infra medium adnata) paullo superantibus; ovariis rectis; stylis filiformibus: cæt. ut in *S. algido* videtur. "High alpine region in moist places, at greater elevation than the preceding: fl. July." Petals nearly half an inch long, of a clear and deep rose-color, while those of *S. algidum*, of the Altaic Alps are described and figured as yellow, or dull rose-color with age, and blunt. As the stamens are adnate to the petals nearly as high as in *S. algidum*, it cannot be the doubtful *S. euphorbioides* of the elder Schlechtendal, from Arctic Siberia, which Ledebour, who took it up, regards as a possible variety of *S. algidum*.

130. *Sedum stenopetalum*, Pursh. All our species should be elaborated anew.

131. *Silene Drummondii*, Hook. The species of this group are much confused in the Flora of North America.

134. *Silene Scouleri*, Hook.

137. *Silene Menziesii*, Hook.

132, 133. *Lychnis apetala*, L. (*L. brachypetala*, Hornem.) Uniflorous and pauciflorous forms.

135. See *Gentiana*, among the Monopetalæ.

136. *Stellaria longifolia*, Muhl.

138. *Cerastium vulgatum*, the var. *Behringianum*, and *C. arvense*, L. mixed.

139. *Sagina Linnæi*, Presl.

140. *Arenaria Fendleri*, Gray, Pl. Fendl.

141. *Arenaria arctica*, Stev., var. γ, Torr. & Gray.

142. *Claytonia arctica* (Adams), var. *megarhiza:* foliis caulinis lanceolato-spathulatis seu lineari-spathulatis basi attenuatis quasi petiolatis; racemo intra folia subsessili (an semper?). *C. megarhiza*, Parry in litt., a name very probably to be adopted. "High alpine stations, extending to the crest of the snowy range; flowers from June to August. Grows in crevices of rocks, its large tap root penetrating to a great depth. Flowers, profuse, white with greenish-purple veins."—The large perpendicular root (about an inch in diameter), with the radical leaves and flowers, are just as in large specimens of *C. Joanneana*, Rœm. & Schult. (*C. acutifolia*, Ledeb. Fl. Alt. and Ic. Pl. Ross., t. 372, non Pall., Willd.) of which, confirmed by Trautvetter in Fl. Taimyrensis, I conclude that *C. arctica*, Adams (published two years earlier) is only a more arctic form. But the leaves of the cauline pair in our plant are much longer and narrower, tapering into a petiole, and they closely subtend the short raceme; wherefore this fine plant would most naturally, and perhaps more correctly, be taken as specifically distinct from the arctic-alpine Siberian one; in which view Dr. Parry's name is appropriate for it. I have seen no intermediate form. But after the experience we have had of the variability of the foliage of Claytonias, I prefer to risk the view here taken.

Aided by Dr. Parry's excellent specimens, I have now reviewed my MS. notes upon Pursh's *C. lanceolata* (which has been such a puzzle), and upon the related perennial species. It will be seen that Pursh's name, descriptive phrase, and figure do not accord; also that he adds, "*Pall. MSS.*," and states that he found in herb. Lamb. "a specimen collected by Pallas in the eastern part of Siberia, perfectly agreeing with the present species,"—doubtless the *C. Joanneana*, Roem. & Sch., of which I have seen Pallasian specimens. I have reason to think that Pursh's plate was made up from this Pallasian specimen and from the materials he had from Lewis, which last also perhaps comprised portions of two species. The radical leaves figured, which certainly are are not "lanceolate," are probably from the Siberian plant; the cauline of the plate are are not "ovate," and are narrower than I have observed them in any Siberian specimens,—in which, however, they are said to vary from ovate to elliptical: the naked corm, resembling that of *C. Virginica*, must belong to that *Claytonia* of the Rocky Mountains, &c., which is so nearly related to *C. Caroliniana*, but with sessile, oblong, linear-oblong, or even linear-lanceolate leaves, when dry 3-nerved from the base, i. e., the *C. lanceolata* of Hooker's Flora, and the *C. Caroliniana*, var. *sessilifolia*, Torr. in Pacif. R. R. Rep., 4, p. 70. Now, my notes, made in the year 1839, upon Pursh's materials in the Lambertian herbarium, state that the specimen there ticketed *C. lanceolata* by Pursh is the tuberiferous or corm-bearing plant, above-mentioned, and which may therefore, if permanently distinct from its eastern relatives, retain that name. With it is a specimen, ticketed by Pursh "*C. lancifolia*," having lanceolate-ovate cauline leaves. This may have furnished the model for the flowering stem of Pursh's figure, but it is not accompanied by any root or any radical leaves; while, as to the corm-bearing species, these bear only single or very few radical leaves, and mostly

none at all when the corm produces its flowering stem. The *C. lanceolata* of Hooker's Flora, as to the specimens, so accurately characterized in his remarks, is the same cormiferous species as Pursh's. But his specific phrase and the closing remark are evidently more or less influenced by Pursh's figure. The present discovery of a great tap-rooted *Claytonia* in the Rocky Mountains renders it not unlikely that Lewis and Clarke may have gathered the two species,—this without the root, —and that Pursh may have confounded them. However that may be, the names of the species concerned should stand as follows:—

C. LANCEOLATA, Pursh, fide herb., &c., for the corm-rooted plant of the Rocky Mountains and California, with sessile narrow leaves. Yet this is quite likely to prove a variety of *C. Caroliniana* (which also inhabits the valleys of the Rocky Mountains, both in New Mexico and in the British possessions), and that again runs insensibly into *C. Virginica*. It would appear that *C. lanceolata* extends to Kotzebue's Sound (Hook. & Arn., Bot. Beech. Voy., p. 123), and to the opposite Asiatic coast (Cham. in Linnæa, 6, p. 563). But Hooker and Arnott's *C. Virginica* from the latter region is probably

C. TUBEROSA, Pall. in Willd. Rel., ex Schult. Syst. 5, p. 486. *C. Virginica*, Willd. Herb. If I may rely on my notes taken in the herbarium of Willdenow in the year 1839, this plant of Pallas, with leaves as narrow as those of our *C. Virginica*, has the cauline ones closely sessile, and a *fusiform caudex* (so that the *C. Virginica* of Fenzl in the Flora Rossica is factitious); and I suppose that *C. Eschscholtzii*, Cham. l. c., is the same plant. Also that *C. acutifolia*, Pall. in Willd. Rel. l. c., is a broader leaved form of it, verging towards

C. ARTICA, Adams. This species (to which I dubiously append Parry's No. 142) was founded upon the most reduced and arctic state of the species to which belong *C. Sibirica*, Pallas in herb. Willd., but not of Linnæus,* *C. Joanniana* of Schultes, *C. acutifolia* of Ledebour, and *C. arctica*, var. *maxima*, of Chamisso.

143. *Talinum pygnæum* (sp. nov.), Gray in coll. H. Engelmann, Exped. Bryan. I know not if this is yet published. Parry's specimens closely resemble those gathered by H. Engelmann at Bridger's Pass, in the year 1856, except that they are larger and finer. It is an acaulescent species, with a fusiform perennial root, the crown bearing a cluster of linear or spatulate-linear leaves, with one-flowered and mostly bibracteolate peduncles in their axils.

144. *Ceanothus Fendleri*, Gray, Pl. Fendl.

145. *Ceanothus velutinus*, Dougl., near the var. *lævigatus*, Torr. & Gray.

146. *Berberis Aquifolium*, Pursh, var. *repens*.

147. *Papaver alpinum*, L. (*P. nudicaule*). High alpine.

148. *Callirrhoë involucrata*, Gray, Pl. Fendl., &c.

149. *Ribes lacustre*, Poir. An alpine form: "the common alpine Gooseberry, fruit reddish, hispid: flowers brownish," fewer in the ra-

* The statement respecting the *C. Sibirica* of the Linnæan herbarium, made in the Flora of North America, 1. p. 476, and for which I am responsible, is not borne out by my MS. notes, which, on the contrary show that *C. Sibirica*, L., is entirely *C. alsinoides*, Sims.

ceme than in the common plant. This is probably *R. setosum*, Dougl.; at least it is the plant cultivated under that name, many years ago, by Loddiges.

150. *Ribes cereum*, Dougl. "Fruit reddish or amber-colored, insipid."

151. *Ribes hirtellum*, Michx. "Fruit dark purple, very acid."

152. *Ribes prostratum*, L'Her.

153. *Rhus trilobata*, Nutt., a variety of *R. aromatica*.

154. *Archangelica Gmelini*, DC. Dr. Hooker, in his paper on arctic plants, has referred not only the *A. littoralis* or *Norvegica* of N. Europe, but also *A. Gmelini* and *A. atropurpurea* to *A. officinalis*. I have already in more than one place insisted that *A. Gmelini* (the *Physolophium* of Turczaninow, *Cœlopleurum* of Ledebour, &c.) is a good *Archangelica;* but for want of good fruit of *A. officinalis* and *A. littoralis* I am unable to judge whether the latter connects *A. Gmelini* with the former. But I have no question (theories of derivation apart) that our *A. Gmelini* and *A. atropurpurea* are abundantly distinct, as well in their fruit as in their whole appearance. "Growing in truly alpine situations."

155. *Berula angustifolia*, Koch; a strict form.

156. *Conioselinum Fischeri*, Wimm. Just like the plant of the Northwest coast, and the *C. Tartaricum* of North Europe. But also not different, as far as I can see, from *C. Canadense*, so that we may extend the synonymy and range as given by Dr. Hooker. It ranges south to the mountains of New Mexico east of the Rio Grande, and in the Alleghanies to North Carolina.

Leptotænia dissecta, Nutt., was gathered, a single specimen, at the foot of the Rocky Mountains.

157. *Cymopterus terebinthinus*, Torr. & Gray, var. *C. fœniculaceus*, Nutt.

158. *Cymopterus alpinus* (sp. nov.): caudice cæspitoso; foliis pinnatisectis, pinnis 3–5 approximatis 3–7-partitis, segmentis lineari-lanceolatis acutiusculis vel mucronatis integerrimis seu inferioribus 2–3-fidis; scapo 2–4-pollicari umbellam subcapitatam gerente; involucellis subunilateralibus 5–7-partitis, segmentis linearibus seu lanceolatis viridibus flores aureos adæquantibus; calycis dentibus lanceolato-subulatis persistentibus; alis fructus æqualibus suberoso-incrassatis vix undulatis; valleculis 1–2-vittatis, commissura 4-vittata; carpophoro nullo. "On high alpine ridges, along with *Primula angustifolia*, one of the earliest plants to flower." Leaves rather shorter than the scapes, glabrous, not glaucous, the margins minutely ciliolate-scabrous; segments 1½ or 2 lines long, in the smaller specimens only three in number. Fruit (of which very little was gathered) only 2 or 3 lines long. This is most probably the Umbelliferous plant collected by Dr. James in this same district, without fruit, and described in Dr. Torrey's account of James's collection, p. 207, but not named.

160. *Cymopterus montanus*, Nutt.

159. *Thaspium montanum*, var. *tenuifolium*, Gray, Pl. Wright.

161. Probably *Thaspium montanum*, Gray, Pl. Fendl. In flower only.

162. *Pachystima Myrsinites*, Raf. (*Myginda myrtifolia*, Nutt.)

163. *Saxifraga punctata*, L. (*S. æstivalis*, Fisch.)

165. *Saxifraga flagellaris*, Willd.; with scanty runners.

164. *Saxifraga Hirculus*, L. A very condensed, cæspitose, high-alpine form, the flowering stems barely two inches high, perhaps the same as *S. propinqua*, Brown, from the arctic shores. *S. serpyllifolia* of Pursh seems very near this, with smaller flowers, &c.

166. *Saxifraga Hirculus*, L. A small form, only 2 or 3 inches high, but quite like the common Arctic American specimens.

167. *Saxifraga cernua*, L.

168. *Saxifraga bronchialis*, L.

169. *Saxifraga nivalis*, L. Dr. Hooker might properly have cited *S. Virginiensis* as the temperate form of this species, and *S. vernalis* as a connecting form. *S. Virginiensis* stands independently in Hooker's list, resting on *S. reflexa*, Hook., from the shores of the arctic sea. I have never seen *S. reflexa*; but, from the character (especially the upwardly dilated filaments) and the fine figures in the Flora Boreali-Americana, I suppose that it is rather a form of *S. Dahurica*, to which *S. flabellifolia*, R. Br., also belongs.

A solitary specimen, from alpine brooks, may be *S. heiracifolia*, but it is too young for determination.

170. *Saxifraga cæspitosa*, L., var.; a very condensed alpine form: *S. uniflora*, R. Br.

171. *Mitella* (*Mitellaria*) *pentandra*, Hook.

172. *Heuchera bracteata*, Seringe. An interesting rediscovery of one of plants before known only from a single specimen in Dr. James's collection. According to Dr. Torrey, it accords with the original plant, but is larger-leaved. "Common in crevices of rocks, from the base of the mountains to alpine situations."

173. *Heuchera parvifolia*, Nutt.; a small state. "Strictly alpine, always exhibiting its close spikes, which are never elongated as in No. 174.

174. *Heuchera parvifolia*, Nutt., the taller form, exactly Fendler's No. 264, and Wright's 1098. "Valley of Clear Creek, common." Dr. Parry remarks: "I did not suspect this to be a variety of the former: its loose habit and long inflorescence seem to distinguish it; and no intermediate forms were noticed."

175. *Jamesia Americana*, Torr. & Gray; from the original habitat. The genus was founded, in the Flora of North America, upon a specimen so imperfect that it was omitted in the original account of Dr. James's collection. It is now well known, having been collected by Fendler, &c.; and, as it proves, the discoverer (now recently deceased) is commemorated by a most distinct and interesting genus.

176. *Trifolium dasyphyllum*, Torr. & Gray. Less downy than Dr. James's plant is described, the flowers considerably smaller than those of *T. alpinum*.

177. *Trifolium nanum*, Torr. "On the crest of high alpine ridges, in dense patches." This and the preceding are interesting re-discoveries.

178. *Trifolium Parryi* (sp. nov.): Involucrarium: glabrum, surculosum, subcaulescens; scapo 3–4-pollicari basi foliato; stipulis ovatis scariosis; foliolis oblongis argute dentatis; involucro scarioso 5–7-par-

tito capitulo plurifloro multum breviore, segmentis ovatis obtusis; calycis corolla rubro-purpurea subtriplo breviore, dentibus lato-subulatis tubum campanulatum subæquantibus; legumine sessili 3–4-spermo. "On high, grassy, alpine slopes. Flowers bright-red and purple, conspicuous." A well-marked species, very different from any of our involucrate species except *T. fucatum*, which has similar, but larger, stipules and corollas. Leaflets 6 to 12 lines long. Flowers 20 or more in the head, about 9 lines long, the corolla persistent and somewhat ampliate after flowering.

179. *Oxytropis splendens*, Dougl.

180. *Astragalus oroboides*, Hornem. *Phaca oroboides*, DC. *P. elegans*, Hook. I possess a mere fragment, without fruit, of the original *Phaca elegans* of Hooker's Flora; but I have a fine specimen, so named, from Bourgeau's Saskatchawan collection; and "*Phaca* No. 5" of the same collection is just like my original specimen of *P. elegans*, and like *P. oroboides* from Labrador communicated by Dr. Steetz. The latter and European specimens have rather less slender calyx-teeth; but no other difference is manifest. The elliptical and sessile legume has the dorsal suture more or less intruse. "*Phaca* No. 2" of Bourgeau's collection in the Rocky Mountains is probably a variety of *A. alpinus*, but has a shorter stipe to the legume and longer, very slender calyx-teeth.

181. *Astragalus* (*Phaca*, Hook.) *nigrescens*, Gray. *Homalobus dispar*, *multiflorus*, and *nigrescens*, Nutt.

182. *Astragalus alpinus*, L. *Phaca astragalina*, DC.

183. *Oxytropis Lamberti*, Pursh., if the flowers are purple as they seemingly are. Also *O. sericea*, Nutt., I presume.

184. *Astragalus*, near *glareosus*, Dougl., but the raceme many-flowered. Fruit not seen.

185. *Astragalus* (*Phaca*, Hook.). *Pectinatus*, Gray.

186 and 189. *Oxytropis Lamberti*, Pursh.

187. *Lathyrus ornatus*, Nutt. On the lower Platte.

188. *Lathyrus linearis*, Nutt.

189. *Astragalus gracilis*, Nutt.

190. *Astragalus* (*Orophaca*) *sericoleucus*. *Phaca sericea*, Nutt. Sand hills of the Upper Platte, May: in flower.

191. *Oxytropis hàna*, Nutt. (*O. arctica*, var.?). "High valleys, rooting in granitic sand, in shade of *Pinus Banksiana*: rare."

192. *Dalea alopecuroides*, Willd. Doubtless from the plains.

193. *Astragalus Parryi*, (sp. nov.): cæspitoso-multicaulis e radice crassa, humifus, laxe villosus; stipulis fere discretis liberis ovatis, superioribus ex ovato lanceolato-subulatis; foliolis 15–21 ovalibus supra glabrescentibus glabrisve; pedunculis folium subæquantibus; racemo brevi 6–10 floro; floribus (6–8 lin. longis) subpatentibus; calycis dentibus attenuato-subulatis tubo oblongo-campanulato æquilongis; corolla ochroleuca ("viridulo-lutea") carina apice purpurascenti; legumine pollicari hirsuto coriaceo subinflato ovato-lanceolato acuminato incurvo uniloculari, suturis utrisque leviter intrusis. *A. succumbens*, Torr. & Gray, in Pacif. R. Road Rep. 2, (coll. Pope) p. 163, non Dougl. "Common in dry gravelly banks along Clear Creek: prostrate, with decumbent branches, matting the ground." Capt. (now General) Pope collected it in flower on the Llano Estacado, and Mr. Gordon in the same condition in the

Raton Mountains. It is with great unwillingness that one adds another species to this great genus, while several in the books are still imperfectly known. I had before referred this to *A. succumbens*, but the forming fruit of Parry's specimens shows that it is very different, and more allied to *A. glareosus*, Dougl. (*A. argophyllus*, Nutt.) yet it can hardly have been confounded with that species.

194. *Hosackia Purshiana*, Benth. Valley of the Platte.

195. *Dalea laxiflora*, Pursh. From the plains.

196. *Sophora sericea*, Pursh. Probably from the plains.

197. *Thermopsis rhombifolia*, Nutt.

198. *Psoralea lanceolata*, Pursh.

200. *Lupinus*. The same as Fendler's No. 168, which was doubtfully referred to *L. laxiflorus*. It cannot be named correctly until the related species are revised.

201. *Prunus* (*Cerasus*) *Virginiana*, L.

202. *Sibbaldia procumbens*, L.

203. *Dryas octopetala*, L.

204. *Geum rivale*, L. A specimen of this in fruit (in herb. Durand) collected at Eureka by Mr. Howard, has the head of carpels sessile; but still it appears to be only *G. rivale*, not *G. geniculatum*.

205. *Geum* (*Sieversia*) *Rossii*, Seringe. Large forms, a span high.

206. *Spiræa discolor*, Pursh. (*S. ariæfolia*, var. *discolor*, Torr. & Gray.)

207. *Spiræa opulifolia*, L., a small-leaved form, near the var. *pauciflora*, Torr. & Gray.

208. *Rosa blanda*, Ait.

209. *Cercocarpus parvifolius*, Nutt. The plant so long ago collected by Dr. James, but mistaken for the Mexican *C. fothergilloides*.

210. *Rubus deliciosus*, Torr. "A profusely-flowering shrub, abundant from the base of the mountains to the upper valleys, associated with *Jamesia*. Flowers white, never purplish. Fruit small, coarse-grained and insipid, ripening few largish grains." With Dr. Parry, I cannot doubt that this is James's *R. deliciosus*, notwithstanding the discrepancies. Those relating to the berries are principally a matter of taste, under different circumstances. The color of the petals was probably mistaken by the describer. To this species accordingly belongs my *R. Neo-Mexicanus*, Pl. Wright.

211. *Rubus Nutkanus*, Moçino.

212. *Rubus Idæeus*, L. "Alpine."

213. *Potentilla fissa*, Nutt. In the mountains.

214, 215. *Potentilla nivea*, L. Slender forms.

216, *Potentilla Pennsylvanica*, L., var. *strigosa*.

217. *Potentilla concinna*, Richards.? a large form. At least a solitary specimen of undoubted *P. concinna*, from a higher station, is ticketed by Dr. Parry as a dwarf form of No. 217.

218, 219, 220, are forms of *Potentilla diversifolia*, Lehm., including *P. glaucophylla* and *P. Drummondii*, Lehm., and probably some others. The whole group requires complete revision and much reduction.

221. *Adoxa Moschatellina*, L.

We are happy to state that Dr. Parry, assisted by Mr. E. Hall, is now again in the Rocky Mountains, and at the last accounts was about to ascend Pike's Peak. An interesting botanical collection may be expected.

222. *Sambucus racemosa*, L. Apparently just the European plant, and a glabrous state of *S. pubens*, Michx.

223. *Symphoricarpus montanus*, H.B.K. New to our flora; well marked by its elongated corolla. *S. glaucescens*, H.B.K., appears, in probably authentic specimens, not to be really different.

224. *Lonicera involucrata*, Banks.

225. *Viburnum pauciflorum*, Pylaie.

226. *Vaccinium cæspitosum*, Michx. Just like the White-Mountain plant. "Strictly alpine."

227. *Vaccinium Myrtillus*, L. var. *microphyllum*, Hook. Fl. Bor. Am. Surely a remarkable variety of *V. Myrtillus*, the flowers as small in proportion as the leaves. According to Dr. Parry, it is the "usual alpine form, growing in closely branched masses, in the shade of stunted evergreens, taking the place of 228, which is found lower down, in pine woods. Fruit small, purplish, without bloom, mild and rather insipid in taste." Dr. Hayden gathered it on the Black Hills of the Platte.

228. *Vaccinium Myrtillus*, var.? The branchlets less strongly angled, and the leaves less reticulated and toothed than in the European *V. Myrtillus*. In the flowers, &c., it is as if intermediate between that species and *V. cæspitosum*. Fuller specimens, and the fruit, are wanted.

229. *Pyrola minor*, L. Collected by Fendler (No. 644) as far south as Santa Fé.

230. *Pyrola chlorantha*, Swartz. Dr. Hooker is right in his suspicion that the Greenland plant of Dr. Kane, referred by Durand to *P. chlorantha*, is *P. grandiflora*; but he is quite wrong, as I think, in referring *P. chlorantha* to *P. rotundifolia*, of which *P. grandiflora* is evidently a mere variety.

231. *Pyrola* (*Moneses*) *uniflora*, L. "In deep pine woods."

232. *Pyrola rotundifolia*, L. var. *uliginosa*. (*P. uliginosa*, Torr.) "In moist, shady woods; flowers rose-color." This is certainly connected with *P. rotundifolia* through *P. asarifolia*. To the synonyms of *P. rotundifolia*, Dr. Hooker might have added *P. occidentalis*, R. Br., *P. bracteata*, Hook., *P. picta*, Hook., &c., but should exclude, as I suppose, both *P. chlorantha* and *P. elliptica*.

233. *Pyrola secunda*, L.

234. *Gaultheria Mirsynites*, Hook. A rare and peculiar plant.

235. *Mimulus luteus*, L. A slender form.

236. *Collinsia parviflora*, Dougl.

237. *Veronica alpinus*, L.

238. *Gerardia aspera*, Benth. Valley of the Platte.

239, 240, 241. *Castilleia pallida*, Kunth. With red bracts, therefore verging to *C. miniata*, Dougl., which I conclude to be only a red-bracted variety of *C. septentrionalis*, Lindl., which is the form of *C. pallida*, with long, well-developed galea. For a revision of the genus, see Supplement III, infra.

242. *Castilleia pallida*, Kunth; nearer the type of the species (*C. Sibirica*, Lindl.) and *C. occidentalis*, Torr.

245. *Castilleia pallida;* the taller and broader-leaved form with longer galea, like the plant of the White Mountains of New Hampshire, *C. septentrionalis*, Lindl.

243. *Castilleia breviflora. Euchroma breviflora*, Nutt. in herb. Acad., Philad.

244. *Castilleia integra*, Gray, l. c.

246. *Castilleia linariifolia*, Benth. The same as Fremont's plant.

247. *Orthocarpus luteus*, Nutt.

248. *Pedicularis racemosa*, Benth. in Hook. Fl., &c. Fine specimens of a rare and interesting species. "Grows in patches near the limit of trees. Leaves dark-green and shining. Flowers yellowish-white. July, August."

249. *Pedicularis bracteosa*, Benth. l. c. "Near the foot of alpine ridges; rare."

250. *Pedicularis Grœnlandica*, Retz. Obs. 4, t. 1. *P. surrecta*, Benth. l. c.; a form with larger flowers and longer beak. Torrey was quite right, as it appears, in referring this plant to *P. Grœnlandica*. Dr. Parry's specimens well accord with the figure of Retz, except that the beak is perhaps a little longer. Bourgeau collected it in the Saskatchawan district with the beak no longer than Bentham states it to be in the Greenland plant. In the Rocky Mountains it is "not uncommon on the borders of subalpine marshes, or of high alpine ridges; in the former stations tall and slender; in the latter shorter and stronger; flowers reddish-purple."

251. *Pedicularis Parryi*, (sp. nov. sect. *Rhyncolophæ*, Bunge, seu *Edentularum*, inter *Unciatas* et *Scapiformes*, Benth.): glaberrima; caule ultra-semipedali subnudo; foliis lineari-lanceolatis pectinato-pinnatipartitis petiolatis, caulinis 1–3 parvulis; segmentis linearibus acutis (ad summum 3 lin. longis) cartilagineo-serrulatis; bracteis parvis trifidis; floribus plurimis breviter pedicellatis in spicam angustam subconfertis; calycis membranacei 5-striati demum subinflati breviter 5-dentati dentibus lanceolatis integerrimis intus lanulosis; corollæ sordide flavæ galea angusta apice incurva sensim in rostrum longiusculum emarginatum haud denticuliferum subdecurvum labium inferius (lobis eroso-crenulatis) multo superantem producta; filamentis glaberrimis. "On alpine ridges. Flowers of a dirty or faded yellow," about half the size of those of the Siberian *P. compacta;* the shape and size of the beak nearly that of *P. ornithorhynca*, which is apparently *P. pedicellata*, Bunge (*P. subunda*, Benth.). Spike naked, 2 to 4 inches long; the lower flowers rather sparse, on pedicels of $1\frac{1}{2}$ to 2 lines in length. The nearest affinity of the species is with *C. compacta*, Bunge, which is larger in all its parts, and

leafy-stemmed, the cauline leaves sessile, their much larger segments pinnatifid or incised, the flowers of the dense spike sessile, the calyx more inflated, the lower lip of the corolla nearly equalling the galea, and two of the filaments slightly bearded.

252. *Pedicularis procera*, (sp. nov. *Bicuspidatarum*): caule 1½–3-pedali crasso foliato superne cum spica densiflora 9–18-pollicari molliter pubescente; foliis glabris pinnatipartitis, (radicalibus sæpe sesquipedalibus pinnatisectis), segmentis lanceolatis laciniato-pinnatifidis, lobis serratis vel incisis; bracteis e basi ovato-lanceolata lineari-elongatis, inferioribus pectinato-pinnatifidis flores superantibus; calyce subæqualiter 5-fido, lobis lanceolatis integris tubo subdimidio brevioribus; corollæ (ultrapollicaris sordidæ viridio striatæ) galea apice cucullata erostri truncata bidentata labium sub-patentem breviter trilobum vix æquante. "Shaded hill-sides, not uncommon in scattered localities." Collected also by Fremont in 1845, and in the Sandia Mountains further south, by Dr. J. M. Bigelow; but only in fruit. A striking species, quite distinct from any other known to me.

253. *Pedicularis Sudetica*, Willd., var. "High alpine; rare." The specimens accord very well with *P. Sudetica*, especially with Russian-American specimens, except the deeply emarginate summit of the galea is almost or quite edentulate. Bunge describes them as "breves triangulares basi latos;" but they are often subulate. I fancy that *P. nasuta* of Kamtschatka is very near Dr. Parry's plant. *P. Kanei*, of Durand, from Arctic Greenland, does not belong to *P. Sudetica*, as Dr. Hooker supposed, but to *P. lanata*, Willd.; which again, contrary to Bentham and Dr. Hooker, I must regard with Bunge as clearly different from *P. hirsuta*. It is much nearer another species which Dr. Hooker refers to *P. Sudetica*, viz. *Langsdorffii*, with which it has been confused, but it is perfectly edentulate. The teeth of the latter, however, are inflexed, and so may escape observation. All the continental American "P. hirsuta" I have seen belongs to *P. lanata*. All these species are well discriminated by Bunge in Ledebour's Flora Rossica.

254. *Synthyris plantaginea*, Benth. Wholly below the alpine region. The same as Fendler's No. 582. Radical leaves mostly obtuse or rounded (rarely at all cuneate) at the base; scape multibracteate. Flowers all short-pedicelled; sepals ovate, obtuse, villous-ciliate, becoming nearly glabrous with age. Corolla pale, very deeply 2-parted or even divided, the upper lip cuneate-obovate, entire or obscurely erose, a little exceeding the calyx, twice the length of the 3-lobed lower lip. Stigma capitellate.—The species of the genus need a complete revision, which I am unable now to attempt. In *S. Houghtoniana*, which I formerly had in cultivation, a great diversity was observed in the calyx, (varying from 2–3-parted to 5-parted), corolla, (2–4-parted, as described in the Manual, but the lips or divisions nearly of equal length, the lower not seen very short, as described in the Prodromus), stamens (either two or four), and even the ovary, which is occasionally tricarpellary.

255. *Synthyris alpina*, (sp. nov.): spithamæa; foliis radicalibus ellipticis seu ovalibus nunc subcordatis creberrime crenatis mox glaberrimis; scapo superne folioso-bracteato; spica brevi densa; sepalis lanceolatis extus præsertim ad margines cum bracteis longissime villosis; corolla

bipartita, labio superiori latissimo eroso, inferiori multo minori 2–3-partito, lobis angustis; stigmate capitato. "Growing in crevices of rocks, on the dividing ridge, at the elevation of 10,000 feet. Very different from No. 254, strictly confined to the high alpine region, with glossy foliage and a neat spike of pale blue flowers." Leaves 1½ to 2 inches long, on slender petioles, rather strongly crenate, a little fleshy, very smooth, or early becoming so, as also the lower part of the scape. Bracts on the upper part of the scape ovate or in the spike lanceolate, sessile, and ciliate with very long woolly hairs. Spike only an inch long in flower, very dense, and very woolly; flowers nearly sessile; the corolla larger and more exserted than in *S. plantaginea*. Sepals in flower lanceolate and acute or acutish; but in a fruiting specimen broader and obtuser. Only two stamens seen, which, as in other species, are almost hypogynous.

256. *Chionophila Jamesii*, Benth. "On bare or grassy ridges of the snowy range, July. Flowers pale cream-color." A most interesting rediscovery, enabling us nearly to complete the account of this well-marked genus. The only known original specimen, and a very scanty one, is in the Hookerian herbarium, to which it was contributed by Dr. Torrey, mixed with *Pentstemon Jamesii*, and no specimen is extant in his own herbarium. But I presume that Dr. Parry's excellent specimens are of the same species, notwithstanding the striking discrepancies. The calyx, which gives the character to the genus, is gamophyllous almost to the summit, with 5 broad and short nearly equal teeth, considerably ampliate, thin, membranaceous, or even scarious. Corolla tubular, sliglitly dilated upwards, *nearly twice the length of the calyx*, and with a sort of *palate to the lower lip very densely bearded*. The original specimen must be in poor condition if this beard was overlooked. *Sterile filament much smaller and shorter than the others*, smooth. Stigma small, obtuse and entire. Radical leaves in the larger specimens 2 or 3 inches long, lanceolate-spatulate. Scape 2 to 4 inches high, *puberulent*. Flowers solitary in the axils of the small floral leaves, on very short and *ebracteolate pedicels*.

257. Vide **after 261, 262.**

258. *Pentstemon acuminatus*, Dougl. in Bot. Reg. t. 1285, var. *P. nitidus*, Dougl., Benth. *P. Fendleri*, Gray in Pacif. R.R. Rep., 2, p. 168, t. 5. "A wide-spread, variable species, with pale glaucous leaves and palish or bright blue flowers." Bentham describes *P. acuminatus* as with "filamento sterili filiformi glabro." But Lindley, in Bot. Reg., where the species was published, says "apice leviter pilosum, aduncum;" and his figure represents a large state of what I must consider the polymorphous species one form of which I published as *P. Fendleri*, and which is certainly *P. nitidus*. *P. eyananthus*, Hook. Bot. Mag., which in the Botany of the Mexican Boundary I had referred here, is however figured as having hairy anthers, like those of *P. glaber*, and with such a corolla as the latter has, but with narrow sepals. It may be a very well developed form of *P. glaber*, var. *alpinus*.

264. A narrow-leaved variety of the foregoing, clearly of the same species; "from plains east of Denver, with numerous bright blue flowers and narrow linear leaves." Similar specimens from Eureka, Mr. How-

ard, but only a span high, as well as others before me, (among them Geyer's No. 154, and some of Hooker's *P. acuminatus*, var. *minor*, from Carlton House), manifestly connect this species with *P. cæruleus*, Nutt., the oldest of all these names. *P. secundiflorus*, Benth., is another connecting form.

259. *Pentstemon glaber*, Pursh, var. *alpinus*. *P. alpinus*, Torr. in Ann. Lyc., N. Y. Only an alpine form of the next, with more attenuated sepals, the particular shape of which is inconstant in the genus. Dr. Parry remarks: "no doubt a variety of *P. glaber*, being almost exactly a dwarfed representative of that elegant species; and its alpine situation would sufficiently account for its stunted size."

260. *P. glaber*, Pursh, (*P. erianthera*, Fraser, Nutt.) "Common on dry hill-sides along the valley of Clear Creek; a splendid species, its large, brilliant, inflated, blue corolla streaked with reddish-purple stains." The name first published, with a character, ought to be restored for this species; since the anthers are but slightly hairy, in comparison with those of the section *Erianthera*, and are frequently glabrous, except a ciliation or mere denticulation at the margin of the valves. The beard at the top of the sterile filament is sometimes almost wanting, and sometimes sparsely extended downwards. I cannot doubt that the figure of *P. speciosus* in Bot. Reg., t. 1270, represents this species, and, returning to an old opinion in this regard, should reduce that to the present species.

261, 262. *Pentstemon glaucus*, Graham in Edinb. Phil. Jour. July, 1829, p. 348; Lindl. Bot. Reg. t. 1286. "Rather abundant at the foot of alpine ridges, above the limit of trees; the taller specimens from a lower elevation in the valley of Clear Creek. The more common form has pale cream-colored flowers with greenish stripes, and pale green leaves; there is a more rare, purple-flowered variety; both quite bilabiate." Small specimens of this are found in James's collection, mixed with *P. Jamesii*, Benth., and formerly confounded by Dr. Torrey with *P. albidus*,—to both of which they have some resemblance. The species, however, is more allied to *P. gracilis*, Nutt.; but it has a more inflated corolla even than *P. pubescens*, with which Bentham confounded it. The specific name is far from distinctive or good.

257. *Pentstemon humilis*, Nutt. in Herb. Acad. Philad.; apparently a reduced, alpine variety of *P. glaucus*, with shorter and rather less ampliate corolla. Specimens collected at Eureka by Mr. Howard (in herb. Acad. Philad.) ally Dr. Parry's plant with the *P. gracilis*, as figured in the Botanical Magazine. According to Dr. Parry it is: "the common mountain species, growing in tufts on rocky places; flowers bright deep blue; leaves glossy and bright green; plant varying from 3 inches to a foot in height."

263. *Pentstemon procerus*, Dougl. About a span high, and it is seldom very much taller. There was doubtless some mistake in the imposition of this name; but it is surely only a variety of *P. congestus*, with purple-blue flowers.

265. *Pentstemon albidus*, Nutt. A common species of the plains. *P. pumilus*, Nutt., is perhaps an alpine state of this. But Fremont's specimens, referred to *P. pumilus* by Bentham, appear to belong to a

remarkably dwarf and tufted, unpublished species, *P. cæspitosus*, Nutt., which Dr. Parry has detected the present season, and sent in a letter.

266. *Campanula Langsdorffiana*, Fischer.; Trauttv. & Meyer, Fl. Ochot., p. 60. *C. heterodoxa*, Bong. Fl. Sitch., an Vest.? Probably also *C. adscendens*, Vest, as it seems to be more allied, except in the size of the flowers, to *C. uniflora* than to *C. rotundifolia*. The calyx-lobes are linear-subulate from a broad base, nearly equalling the corolla, and more or less toothed. Additional specimens, needed to clear up the species, it is hoped may be obtained this summer. It is said to be "common in moist, grassy places on the borders of Upper Clear Creek. Flowers deeper blue than those of *C. rotundifolia*," far larger than those of the next.

267. *Campanula uniflora*, L.

268. *Campanula rotundifolia*, L.; alpine form, like that of the White Mountains of New Hampshire.

269. *Valeriana dioica*, L. (*V. sylvatica*, Richards., &c.)

270. *Galium boreale*, L.; a small form.

271. *Gilia spicata*, Torr. & Gray, ined. *Elaphocera spicata* and *E. affine*, Nutt. in herb. "Growing, with a deep tap-root, in the deep sandy bottoms of Bijou Creek, east of Denver. Flowers light cream-color or flesh-color; the whole plant exhaling a fœtid smell, like bone-filings."

272. *Phacelia* (*Eutoca*) *sericea*, Gray, Man. "A handsome subalpine."

273. *Cuscuta cuspidata*, Engelm.

274. *Polemonium pulcherrimum*, Hook.; with lobes of the corolla rounder. A form of *P. pulchellum*. "A charming alpine plant, adorning the high slopes with its deep blue, nodding flowers; whole plant beset with resinous glands, exhaling a strong odor of musk."

275. *Polemonium cæruleum*, L. "At lower stations."

276. *Polemonium pulchellum*, Bunge; nearly *P. Richardsonii*, Hook. & Arn. "Growing in shade at the farthest limit of bushy tree growth. Flowers delicate faded blue." The limits of species (if such they be) in this genus are indeterminate.

277. *Ipomœa leptophylla*, Torr. Sand hills of the Platte; a characteristic plant of the plains.

278. *Eritrichium aretioides*, DC. *Myosotis nana*, Torr. in Ann. Lyc. N. Y., vix Vill. "Rooting in granitic sand at the highest elevations of the snowy range; flowers of the richest cærulean blue." In flower, and with a little of last year's fruit, which, if normal, will distinguish this from the European *E. nanum*. The corolla is a little smaller. I suppose it to be *E. aretioides* of Arctic Russian America, &c., the fruit of which is undescribed. This Dr. Hooker regards as an arctic state of *E. villosum*. But the mature nutlets of our plant are perfectly smooth, and naked on the margins of the very obliquely truncate back.

279. *Primula angustifolia*, Torr. in Ann. Lyc. N.Y. "Associated with the last. Flowers dull red, changing to purple." An interesting rediscovery of one of James's plants.

280. *Collomia linearis*, Nutt.

281. *Collomia gracilis*, Dougl.

282. *Gilia pinnatifida*, Nutt. ined. The same as No. 655, Fendler.

283. *Gilia* (*Ipomopsis*) *aggregata*, Spreng. *G. pulchella*, Dougl.

284. *Mertensia alpina*, Don.; a loosely paniculate, branching, evolute variety. "Common in the valley of Clear Creek, on gravelly banks, growing in irregular clumps, 12 to 18 inches high; flowers dull blue, in May and June."*

285. *Mertensia Sibirica*, Don. pro parte. *Pulmonaria Sibirica*, Linn. & Pursh, quoad syn. Gmel. *Lithospermum denticulatum*, Lehm. Asperif. *L. Sibiricum*, Ledeb. Fl. Alt., & Ic. Pl. Fl. Ross. t. 207. *Pulmonaria denticulata*, Roem. & Schult., Cham., &c. *Mertensia dénticulata*, Don., DC., Ledeb. Fl. Ross. *Pulmonaria ciliata*, James, Torr. in Ann. Lyc. N. Y. 2, p. 224. *Mertensia ciliata*, Don., &c. Besides the greater smoothness, which is variable, this is distinguished from *M. paniculata* by the much shorter and blunt segments of the calyx, and the leaves are glaucescent beneath. No doubt the Linnæan name must be restored to this (the *Pulmonaria Sibirica* of Pallas resuming the name of *M. Pallasii*, Don.); for it is clearly the plant of Linnæus, and perhaps Pursh's from Canada (but more probably that is *M. paniculata*), and I suspect that Lehmann described his *Lith. denticulatum* from Siberian specimens. Certainly it is not known from Eastern "North America," unless from Labrador. H. Engelmann gathered it at Bridger's Pass in the Rocky Mountains, but my specimens have *M. paniculata* intermixed. Redowskian specimens from Kamtschatka, distributed by Chamisso, are of the present species. It is, writes Dr. Parry, "the common brook-side *Mertensia*, found everywhere along the margins of ice-cold, dashing streams, up to the snow-line, delighting in situations where its pale foliage and delicate blue flowers are bathed in the spray. It grows to the height of 1½ to 3 feet; the stems succulent, the lower radical leaves large and cordate."

286. *Mertensia paniculata*, Don. A reduced and alpine, glabrate state, with much less acute leaves, of that form of *M. paniculata* which answers to *Pulmonaria lanceolata*, Pursh, and *P. marginata*, Nutt. (*M. marginata*, Don., and *M. lanceolata*, DC.) "Moist, grassy places, on the slopes of alpine ridges; flowers bright *alpine* blue." *M. paniculata* ranges from Hudson's Bay to Lake Superior, New Mexico above Santa Fé (626, Fendler) and northwestward. The foliage, calyxes, &c., vary, as in other species, from smooth or glabrous to hirsute, but the narrow and acute segments of the deeply 5-parted calyx are always hispid-ciliate. It obviously includes *M. corymbosa* and *M. pilosa*, Don., the *Lithospermum corymbosum* of Lehmann. Dr. Hooker has not seized the characters which distinguish the species from the foregoing.

287. *Mertensia alpina*, Don. *Pulmonaria alpina*, Torr. in Ann. Lyc. N. Y. "The small-flowered alpine *Mertensia;* flowers dull blue."

288. *Eritrichium glomeratum*, DC. Very fine specimens. "Common on gravelly hill-sides and rocky places from the foot of the mountains to the upper valleys."

289. *Phacelia circinata*, Jacq.

290. *Echinospermum floribundum*, Lehm. In fruit.

291. *Eritrichium crassisepalum*, Torr. & Gray, in Pacif. R.R. Exped. 2, p. 171. A young state, with broad leaves.

292–294, vacant.

* For a revision of the species of *Mertensia*, see Supplement, IV.

295. *Lithospermum pilosum*, Nutt. ex char. This is Fendler's No. 628 and Wright's 1562.

296. *Heliotropium* (*Euploca*, Nutt.) *convolvulaceum*, Gray.

297. *Paronychia*, n. sp. apparently, "—a single patch only, found rooting in a sandbar on Upper Clear Creek," not in sufficient good condition for description. We look for better specimens this year.

297. *Phlox Hoodii*, Richards, var. foliis rigidioribus vix lanatis. *P. rigida*, Benth.? *P. brevifolia*, Nutt. in Herb. *P. muscoides* and *P. bryoides* of Nuttall both belong to *P. Hoodii*.

299. *Gilia* (*Leptodactylon*) *pungens*, Benth.

300. *Silene acaulis*, L.

301. *Dracocephalum parviflorum*, Nutt. "The only representative of Labiatæ in the mountain region."

302. *Salvia Pitcheri*, Torr. Prairies in Kansas. This must be the *S. elongata* of Dr. Torrey in James's collection. It is intermediate between *S. azurea* and *S. farinacea*,—two Salvias which would seem to be distinct enough.

303. *Scutellaria resinosa*, Torr. in Ann. Lyc. N. Y. Upper Platte.

304. *Gentiana Parryi*, sp. nov., Engelm. in Trans. St. Louis Acad., 2, p. t. 10. "Near the foot of alpine slopes." This is, says Dr. Engelmann, "a very handsome species, growing in tufts, each stem bearing several large, purplish-blue flowers with bifid folds, and enclosed by a pair of boat-shaped bracts. Leaves rounded, fleshy, glaucous. Nearly allied to *G. calycosa* and *G. Menziesii*, which, however, have single flowers, without the calyculate bracts peculiar to our species, and to the Siberian *G. septemfida*, with long folds slit into numerous bristling lobes." *Engelm.* The plant of Kreusfeldt, in Gunnison's Expedition, referred to *G. affinis* in the second volume of the Pacific Railroad Report, is of this species, but with narrower leaves, and Fremont's No. 360 (1845) is a small-leaved form of it, which also occurs in Mr. Howard's collection (Herb. Acad. Philad.), in one instance with a six-lobed corolla.

305. *Gentiana frigida*, Hænke, var. *algida*, Griseb. "Abundant on high alpine slopes, in moist places, growing in small tufts among Grasses and Carices." "Apparently an intermediate form between the European *G. frigida* and the Siberian *G. algida*. Stems lower than in the latter, only 4 or 5 inches high; the leaves narrower; flowers fewer and closely sessile; calyx often partly slit; lobes of the corolla very acute, greenish blue, reddish-brown in the dried state, punctate, the folds truncate and crenate." *Engelm.* This is also in Mr. Howard's collection. New to America, but found as near as Kamtschatka.

306. *Gentiana prostrata*, var. *Americana*, Engelm. l. c. t. 9, fig. 10–15. "A very small form, single or with few horizontal branches, 1–1½ inches high, found with No. 309. Distinguished from the European and Asiatic forms by the small, 4-parted deeply blue flowers, nearly entire folds, and oblong-linear capsule, attenuated at the base into a short stipe. Chamisso collected the same form in Russian Arctic America." *Engelm.*

135. *Gentiana humilis*, Stev., Engelm. l. c. fig. 1–5. *G. Fremontii*, Torr. in Frem. Rep. "Along the moist grassy banks of Upper Clear Creek, with *Polygonum viviparum*, almost hidden among the grass. Whole plant succulent, fragile, of a pale sickly color: flowers greenish

with white folds."—"Many leafy, one-flowered, erect or ascending branches, 2–5 inches high, from the base. Distinguished from the allied species, and especially from *G. prostrata*, by its larger rosulate lower leaves, which, as well as the oblong-linear cauline leaves, are cuspidate and often mucronate. The capsules on the taller branches are more or less exsert, on the lower ones I find them often enclosed, or bursting sideways through the integuments. Siberian specimens are absolutely identical with the Rocky Mountain plant." *Engelm.*

307. *Gentiana acuta*, var. *stricta*, Griseb. "Rather common in shady pine woods and moist places on Upper Clear Creek. In shaded places the leaves are pale-green on both surfaces, broad and mostly obtuse; the flowers very pale-blue; in more open localities the leaves are dark-green above, pale below, narrower, the upper most acute, the flowers darker." "Stems a foot high, leaves 1–1¾ inches long, 3–7 lines (the lower ones) wide. Flowers about ½ inch long, always 5-parted; lobes of calyx very unequal, the two longer and broader ones exceeding the tube of the corolla; lobes of the corolla acutish or almost obtuse, half as long as the tube. From Drummond's northern specimens in Herb. A. Gray, our form is distinguished by the less acute leaves, and especially by the larger calyx. A specimen from Lower Canada in Herb. A. Gray, probably representing Michaux's plant, has very acute leaves, smaller flowers, a more regular 4-parted calyx, and very acute lobes of the corolla. The very nearly allied *G. Amarella* of northern Europe has the corolla much less deeply divided, with quite obtuse lobes." *Engelm.*

309. *Gentiana acuta*, var. *nana*, Engelm. in Transact. St. Louis Acad., 2, t. 9, fig. 6–9. "In the higher alpine regions, together with *G. prostrata*, in masses of *Silene acaulis*." "A diminutive form, 1½–2 inches high; flowers few, smaller; lobes of 4–5-parted corolla obtuse; beard consisting of few distinct fibres." *Engelm.* This, from the obtuse lobes of the corolla, would appear to confirm Dr. Hooker's view that *G. acuta* is a form of *G. Amarella*, represented in Lapland by *G. lingulata*, Ag. Some specimens distributed with No. 309 are the ordinary *G. acuta* in a depauperate form, with acute lobes to the corolla.

308. *Swertia perennis*, L.

310. *Frasera speciosa*, Dougl. "A very strict and small-flowered form, with ternate, linear-lanceolate, 7–9-nerved cauline leaves, and linear elongated lobes of calyx rather exceeding the corolla. Fendler's New Mexican specimens (No. 686) have large and obtuse radical leaves (12–16 inches long, 4–5 inches wide); even the cauline leaves are broadly oval, only the uppermost being lance-linear; the inflorescence is loose, and the flowers much larger. Dr. Parry's plant resembles more the figure in Hooker's flora. The cup uniting the base of the stamens is ciliate on its edge in this species. *Frasera Carolinensis* has large, obovate-spatulate, feather-veined radical leaves. *Engelm.*

311. *Primula Parryi* (sp. nov.): *P. nivalis* formæ eximiæ similis, nisi foliolis involucri subulatis seu linearibus quam pedicelli elongati triplo brevioribus; calyce glanduloso (lobis lato-lanceolatis acutis) tubum corollæ rubræ adæquante; corollæ lobis rotundatis obcordato-bifidis.—Limb of the corolla an inch in diameter. Pedicels one to nearly two inches long. This magnificent Primrose needs to be compared with Ledebour's

P. pycnorhiza (a very rare and little known species from the Caucasus, which, however, seems too like *P. algida*), and it doubtless lies between that species and *P. nivalis:* but it can hardly be referred to either, although possibly, all these species may be found to merge in one. Dr. Parry remarks that "This fine species is quite constantly met with on the borders of alpine streams near the snow line; its knotted fibrous roots matted together, and constantly bathed in ice-cold water. Its usual height about 12 to 18 inches: flowers of a deep *carmine red* (fading to purple), with a slight primrose odor; leaves glossy on the upper surface, pale green. It flowers in July. It must be quite extensively diffused in its peculiar localities, and it is a wonder it has not been found before. In my sketch map I have named one mountain stream *Primrose* Creek, on account of the abundance of this plant."

312. *Dodecatheon Meadia*, L. A slender, few-flowered variety of this polymorphous species.

313. *Androsace septentrionalis*, L. Both alpine and in the valleys.

314. *Phacelia Popei*, Torr. & Gray in Pacific R. R. Rep. 2, p. 172, t. 10. "Whole plant of a brownish-green color, often robust, 8 to 15 inches high."

315. *Eriogonum umbellatum*, Torr. in Ann. Lyc. N. Y., 2, p. 241, & in Sitgreaves, Rep. t. 12. Flowering speeimens: flowers bright yellow, as they are in Hayden's and other specimens.

316. The same as 315 in fruit; the perianth changed to pale yellow turning brownish.

318. The same species, apparently, as the two foregoing, but the flowers in the fine and well preserved specimens are obviously white or cream color. Which form is the original of James's collection, I am unable now to determine. Torrey's figure, in Sitgreaves' Expedition is a good one, but there is nothing answering to it in the letter-press. The rays of the umbel are more numerous, slender, and simple in all these specimens than in Hooker's figure of *E. stellatum;* but a Douglasian specimen appears to belong to this species.

317. *Eriogonum flavum*, Nutt.

319. *Eriogonum alatum*, Torr.

320. *Eriogonum annuum*, Nutt.

321. *Eriogonum effusum*, Nutt. Flowers white: those of *E. microtheca*, Nutt., are yellow.

322. *Polygonum tenue*, Michx. Hillsides, near Central City.

323. *Montelia tamariscina*, Gray? male plant.

324. *Euphorbia marginata*, Pursh.

325. *Croton* (*Hendecandra*) *muricatum*, Nutt.

326. *Frœlichia Floridana*, Moq.

327. *Cycloloma platyphyllum*, Moq.

328. *Eurotia lanata*, Moq. *Diotis*, Pursh.

329. *Euphorbia hexagona*, Nutt.

330. *Euphorbia petaloidea*, Engelm.

331. *Solanum rostratum*, Dun. *S. heterandum*, Pursh.

332. *Polygonum viviparum*, L.

333. *Polygonum Bistorta*, L., var. *oblongifolium*, Meisn.

334. *Oxyria digyna*, R. Br. "Common in the alpine region; the specimens collected are from a lower elevation, and are large."

335. *Asclepias verticillata*, L., dwarf form.
336. *Abronia* (*Tripterocalyx*) *cycloptera*, Gray.
337. *Abronia fragrans*, Nutt., figured in the second volume of the Pacific Rail Road Reports.
338. *Acer glabrum*, Torr., var. *A. tripartitum*, Nutt.
339. *Betula alba*, L. var., *glutinosa*, forma *latifolia*, Regel, or nearly.
340. *Alnus viridis*, DC.
341. *Salix glauca*, L. Masc.
342. *Salix cordata*, Muhl.?
343. *Salix reticulata*, L. (*S. sericea*, Pursh.) Alpine.
344. *Salix discolor*, Willd.
345. *Populus tremuloides*, Michx.
346. *Lloydia serotina*, Reich. *Anthericum*, L.
347. *Calochortus venustus*, Benth., ex Torr. The species greatly need revision and diagnosis.
348. *Streptopus amplexifolius*, DC.
349. *Leucocrinum montanum*, Nutt. in Gray, Melanth., p. 110. A rare plant, one of the many which go to demonstrate the futility of an ordinal separation of the *Melanthieæ* from the *Liliaceæ*. Also collected by Mr. Howard. The specimens in both cases not in good state for examination.
350. *Allium cernuum*, Roth.
351. *Zygadenus glaucus*, Nutt.
352. *Corallorhiza innata*, R. Br.
353. *Listera cordata*, R. Br.
354. *Calypso borealis*, Salisb. In spruce woods; not uncommon.
355. *Platanthera obtusata*, Lindl.
356. *Platanthera hyperborea*, Lindl. To this, as I suspected long ago (in Ann. Lyc. N. Y., when endeavoring to distinguish this species from the next), belongs the *Habenaria dilatata* of Hooker's Exot. Fl., t. 95. "Flowers greenish."
357. *Platanthera dilatata*, Lindl. *Orchis dilatata*, Pursh. *Habenaria dilatata*, Gray, in Ann. Lyc. N. Y. "In subalpine swamps." Flowers white. Since my observations upon these two species, made almost thirty years ago, I have often, like other botanists, when superficially examining dried specimens, been tempted to re-unite them. This Dr. Hooker has recently done, in his memoir of Arctic Plants. It is quite as easy to err in combining as in unduly separating species. Having recently examined the two alive, in view of their arraugements for fertilization, (which I may elsewhere describe), I would now state that the structure and disposition of their genitalia and the shape of the gorge of the flower is so different, that, while *P. dilatata* (like its congeners in general) can rarely if ever self-fertilize, *P. hyperborea* readily does so, much in the mannar of *Ophrys apifera* as recently illustrated by Darwin; the former has almost parallel anther-cells, with a narrow stigmatic surface and a sort of trowel-shaped beak between their bases and below, within the narrow gorge, made by the erect position and connivence of the base of the labellum and other petals, are the large and elongated, linear-oblong, viscid discs or glands. In *P. hyperborea* the labellum, spreading from the base, leaves an open gorge, the more exposed stigma is broad and transverse (as figured by

Sir Wm. Hooker in Exot. Fl., t. 95, under the name of *Habenaria dilatata*), the glands are smaller and orbicular, the beak wanting, the anther-cells more divergent, and, from the curvature of the flower, more overhanging, and the stalks of the pollinia very attenuated and weak. Thus disposed, the pollinia very commonly fall out of the anther-cells while the tip of the labellum is still engaged under the point of the upper sepal and petals, or even in the closed buds; and when the labellum is disengaged and becomes recurved, or even before, the pollinia are apt to topple over and fall upon the broad stigma beneath.* That our *P. dilatata* is the *Orchis dilatata* of Pursh I am assured. Our green flowered species should be re-compared with the Iceland *P. hyperborea*, and with this the Iceland *Orchis Kœnigii* (described originally by Retz as with "*labio tripartito*," but referred by Linnæus to *O. hyperborea*, an l annexed by Lindley to a probably quite different species from Unalaschka) should be collated.

358. *Juncus castaneus*, Sm.; an alpine form.

359. *Juncus triglumis*, L. With the last.

360. *Juncus arcticus*, var. *gracilis*, Hook.? Alpine; too young.

361. *Juncus Menziesii*, R. Br. ex Hook.

362. *Luzula parviflora*, DC.

392. *Luzula spicata*, DC., var., approaching *L. Peruviana*. Alpine.

363. *Poa alpina*, L.? "At the foot of the snow banks; July."

364. *Munroa squarrosa*, Torr. *Crypsis*, Nutt. Deep sand beds, east of Denver.

365. *Calamagrostis sylvatica*, Trin. "Dry bottoms of Clear Creek!; July.

368. A purple variety of the above (nearly *C. purpurascens*, R. Br.), in an older state. "Alpine; August."

366. *Muhlenbergia gracilis*, Trin. *Calycodon montanum*, Nutt. Pl. Gamb., ex Thurber.

367. *Aira cæspitosa*, var. *arctica*, Trin. *Deschampsia brevifolia*, R. Br. Alpine.

369. *Buchlöe dactyloides*, Engelm.; both sexes of the Buffalo-Grass. "Plains of the Platte."

370. *Boutelona oligostachya*, Torr.

371. *Eriocoma cuspidata*, Nutt. *Stipa membranacea*, Pursh.

372. *Aira cæspitosa*, L. "Alpine ridges."

373. *Festuca rubra*, L. Too young; "alpine ridges."

374. *Poa laxa*, Hænke.

375. *Poa nemoralis*, L., or one of the species referable to this; "Alpine ridges."

* Another North American Orchid, which self-fertilizes, and that without the aid of insects, is *Gymnadenia tridentata*. In this the anther-cells debisce while the flower-bud is still unopened, and some of the packets of pollen (in this species easily separable from their connections) will be found to have reached stigmatic surfaces, here unusually situated; and I have found an abundance of pollen-tubes to be produced, before the flower had opened. Yet the arrangements for the removal of the pollinia by insects are as perfect as in the species which depend upon insect-aid, and while a portion of the pollen-packets fall away at an early period, the rest remain attached in the usual manner. The plant requires, and will well reward, a critical study.

379. *Poa andina*, Nutt. in herb. Acad. Philad. "Upper Clear Creek."
376. *Poa arctica*, R. Br.? (*P. flexuosa*, Wahl.); a form of *P. laxa?* "Alpine ridges."
377. *Trisetum subspicatum*, Beauv. "Alpine ridges."
378. *Bromus Kalmii*, Gray, Man. "S. Clear Creek; July."
380. *Festuca ovina*, L. "Alpine."
381. *Triticum ægilopoides*, Turcz. Perhaps a variety of *T. caninum*, as Ledebour has it. "Alpine."
382. *Phleum alpinum*, L. "Subalpine."
383, 387, 389. *Carex atrata*, L., var. *nigra*, Boott. (*C. nigra*, All.), except that the perigynia are light-colored. From the var. *ovata*, Boott (*C. ovata*, Rudge), they differ in the sessile and crowded spikes.
384. *Carex rigida*, L.
385. *Carex incurva*, Lightf., with a dense, globular head.
386. *Carex capillaris*, L.
388. *Carex aurea*, Nutt.
390. *Carex lanuginosa*, Michx. S. Clear Creek.
391. *Carex festiva*, Dewey. S. Clear Creek.
393. *Carex bromoides*, Schk.? Too young.
394. *Woodsia obtusa*, Torr. "Subalpine."
395. *Cystopteris fragilis*, Bernh.
396. *Allosorus* (*Gymnogramme*) *acrostichoides*; referred by Sir Wm. Hooker to *A. crispus*. "Alpine."
397. *Notochlæna dealbata*, Kunze. Near Idaho.

SUPPLEMENTS

TO THE

ENUMERATION OF PLANTS OF DR. PARRY'S COLLECTION

IN THE

ROCKY MOUNTAINS.

Supplement I.—*Coniferæ*, by Drs. Parry and Engelmann.

Dr. Parry collected too few specimens of the following Coniferæ for distribution, but as his notes are replete with interest they are given here (under marks of quotation) together with a few remarks of my own. G. E.

Abies grandis, Lindl. "Not common in this region, resembling much the Eastern *A. balsamea*. Fendler's N. Mex. No. 828 is ~~the same.~~

Abies Douglasii, Lindl. "Abundant through the eastern mountain district, except on the higher elevations. A very sightly tree, of the average height of 80 feet, with a graceful oval outline; the spreading branches curving upwards at the extremities. Wood of slow growth, but very indifferent, inclined to warp and crack, turning reddish-brown in drying." This species, as well as the nearly allied *A. Canadensis*, is well distinguished from all our other Pines by the distinctly petioled leaves. Fendler's N. Mex. No. 829.

Abies Menziesii, Lindl. "A finely shaped tree, though of rather stiff outline, of rapid growth; wood very compact, but rather coarse grained and pitchy; the logs taper too rapidly to saw up to advantage." Cones pendulous from the end of the branches. Leaves stouter than in any other allied species, stiff and very acute, almost spinescent.

Abies nigra, Poir. Probably the same as the northeastern tree (characterized by the slender and very acute leaves, ovate cones with thin and crenate margin of the scales), a pale leaved form of which is usually named *A. alba*, but which Prof. Gray has demonstrated to belong to *A. nigra*. The true *A. alba* (leaves somewhat stouter and obtusish, cylindric cones with thickened entire margin of the scales) seems to extend from Canada to the northern Rocky Mountains, where it has been gathered by Bourgeau; but it has not fallen under Dr. Parry's or Dr. Hayden's observation, on the headwaters of the Kettle, Colorado, Missouri

and Columbia Rivers, where *Abies nigra* seems to be abundant, extending down to Santa Fe (Fendler, N. Mex. No. 833). Dr. Parry found it "composing almost the entire forest growth of the mountain slopes of Middle Park about the head of Grand River: a magnificent tree, 80 to 100 feet high, with an even, columnar trunk, below, 2–2½ feet in diameter, tapering upwards; of rapid growth; bark scaly, smooth and quite thin, of a purplish-brown color, full of tannin, and quite different from the rough brown bark of *A. nigra* of Wisconsin; wood remarkably white and soft, free of knots and scarcely resinous, preferred for inside work." Could this be *Abies rubra* Loud., and specifically distinct from *A. nigra?*

Pinus aristata, Engelm., in St. Louis Transact., vol. 2, tab. 5 and 6. Dr. Parry had the good luck to discover this very peculiar and exclusively alpine species "which does not descend lower than 9000 or 10,000 feet," on the higher mountains of Clear Creek. As a full description and a figure has been given in the Transactions of the St. Louis Academy, I confine myself here to the statement that it is our only representative of Endlicher's section, *Pseudostrobus*, which comprises numerous Mexican, a few Central American, and a single West Indian species; it is characterized by quinate entire leaves and horizontal ovate cones, with thin apophyses on the long-mucronate or aristate scales, and small winged seeds. In sheltered situations it forms a tree 40 or 50 feet high and 1 or 2 feet in diameter, but on the higher bleak mountains it is a stunted bush, often thickly covered with fruit. Its growth, at least in the latter localities, is exceedingly slow, as a stick of scarcely more than one inch in diameter, brought back by Dr. Parry, shows nearly fifty annual rings, some of them $\frac{1}{60}$ of a line, and none more than $\frac{1}{6}$ of a line wide.

Pinus flexilis, James. This species, discovered in the same regions by Dr. James, has to some extent remained doubtful, as his description in the account of Long's Expedition, and Torrey's diagnosis in the Annals of the New York Lyceum (vol. ii, p. 249) are based on notes only, no specimens having been collected. By later writers it has been ignored, until Mr. Fendler in 1847 collected it on the mountains above Santa Fe, (Coll. N. Mex. No. 832), when a short notice was published by the writer in the appendix to Wislizenus' Memoir of a Tour to New Mexico, etc., 1848. Endlicher, in his Synopsis Coniferarum, 1847, does not enumerate it, and Carrière in his Traité des Conifères, 1855, credits it to Wislizenus, translating only my short remarks. Nuttall, however, had already (in 1849) given a somewhat extended account of it, with a poor figure, in the continuation of Michaux's Sylva (vol. iii, p. 107, pl. 112), without clearing up the doubts, which Dr. Parry in his present expedition, 1862, is expected finally to settle. My brother, H. Engelmann, collected it on the head waters of the Platte, and Dr. Hayden on the mountains about the head waters of the Yellowstone, Missouri and Columbia rivers. Dr. Parry notes that the cones grow several together, "semipendulous" at the extremity of the horizontal branchlets; while James gave his plant "erect" cones. Near Santa Fe it grows at the elevation of 8000 or 10,000 feet, and in favorable situations becomes 60 or 80 feet high and bears "pendulous" cones, according to Fendler's note. *Pinus flexilis* is certainly intermediate between the sections *Cembra* and *Strobus* of Endlicher, and unites the two, as does *P. cembroides*, Newberry, Pacif.

R. Rep., vol. vi, Bot., p. 44, not Zucc.,* if, indeed, this is not a mere form of *P. flexilis*, approaching by its short cones close to *P. Cembra.* The large seeds of *P. flexilis* are, as Dr. James already stated and as Dr. Hayden confirmed, eaten by the Indians. They are distinguished from those of any other of our Pines by a persistent, sharp, keeled margin, representing the wing.

PINUS PONDEROSA, Dougl., is "common through all the lower valleys and less elevated districts of the mountains, associated with *A. Douglasii* and *A. Menziesii*; a most valuable timber tree." Fendler's N. Mex. No. 831. Male aments cylindrical, several inches long.

PINUS CONTORTA, Dougl., "is quite abundant on the crest and slopes of dry subalpine ridges, forming the principal part of the forest there, and extending to near the snow line; a symmetrical tree of rapid growth, 30 or 40 feet high, with slim and tapering trunk a foot in diameter, a smoothish, grayish-brown bark, detached in thin scales, and tough but coarse wood, which is liable to warp, and rarely cut into boards."

SUPPLEMENT II.—Revision of the *Œnotheræ* of the subsection *Onagra*; by Dr. ENGELMANN.

[*Prefatory Note*, by A. GRAY.—Nuttall, in his Genera, stated that Pursh had confounded two species under *Œ. albicaulis*, viz., his own *Œ. albicaulis* and *Œ. pinnatifida.* In *Plantæ Wrightianæ* I had come to the conclusion that Pursh was right, not then knowing the seeds of *Œ. pinnatifida*, Nutt. Consequently, when good fruit of the latter came to hand, in Wright's second collection, in Pl. Wright, 2, p. 56, I carelessly referred the specimens to *Œ. coronopifolia*, on account of their seeds, notwithstanding their longer capsules, overlooking the other characters, and wrongly supposing that Nuttall's description of the seeds of his *Œ. pinnatifida* or *Bradburiana* somehow belonged to *Œ. coronopifolia*, which, as I had shown in Pl. Fendlerianæ, has such seeds, while those of *Œ. albicaulis* are longer and smooth. Dr. Engelmann has recently corrected this oversight, and in the following memorandum has established the three species upon a good foundation. I greatly doubt the distinctions based upon the duration of the root, although *Œ. albicaulis* and *Œ. coronopifolia* generally, if not always, have the appearance of being perennial, while

* Zuccarini's plant of that name is one of the curious little group of American Nut-pines, including the following four species: *Pinus monophyllos*, Torrey and Fremont, with single (not connate, as Endlicher would have it) leaves; *P. edulis*, Engelm., with 2 leaves; *P. cembroides*, Zucc., (including *P. Llaveana*, Schiede, not Torr., and *P. osteosperma*, Engelm.) with 3 leaves; and *P. Parryana*, Engelm. (*P. Llaveana*, Torr. Bot. Mex. Bound., p. 208, t. 53) with 3–5, mostly 4 leaves. Other characters, taken principally from the bracts of the young shoots, strengthen the specific distinctions. This very natural little group is characterized by the small, almost globose cones, the scales bearing large pyramidal apophyses and large edible seeds, the wings of which remain attached to the scale, which, I suspect, is the case in all "wingless" seeds of pines; in *P. Pinea*, however, the wing is very distinct and detaches itself clearly from the scale and at the same time also from the seed itself, which is likewise the case in the closely allied, though 5-leaved, Californian *P. Torreyana*, Parry, where the wing, besides, is very thick, and of a corky substance. The great variability in the number of leaves in the nut-pines proves that sectional characters taken from them are without value.

Œ. pinnatifida flowers early from a slender monocarpic root; I should not rely much upon the shape and size of the petals; and the leaves are most polymorphous. But, in brief,

Œ. CORONOPIFOLIA, Torr. and Gray, is well marked by the strong villosity of the throat of the calyx, the short and thick, ovoid-oblong, or at most linear-oblong capsules, and the large, oval or oblong, strongly costate seeds, the ribs tuberculate.

The two following both have the calyx glabrous (rarely with a few hairs) in the throat, much larger petals, and larger pods.

Œ. PINNATIFIDA, Nutt., has less elongated and stouter capsules, and small, ovoid, striate-reticulated seeds (with pits between the ribs), apiculate at the hilum.

Œ. ALBICAULIS, Nutt., in all its forms, has elongated-oblong and perfectly smooth seeds, and its longer, linear, capsules are closely sessile by a broad base, and mostly porrected or divaricate from the axis which bears them, often flexuose.

Dr. Parry's No. 116 is *Œ. pinnatifida;* his 117, probably a canescent form of *Œ. albicaulis;* neither are in fruit.

The following communication from Dr. Engelmann was received too late for insertion in its proper place in the July No. of the Journal. A. G.]

"A large suite of specimens enables me to clear up some difficulties which have environed the following species of *Œnothera.*

"1. ŒNOTHERA CORONOPIFOLIA, Torr. & Gr. Fl. 1, p. 245; Gray, Pl. Fendl., p. 43. Perennis, saepe multicaulis, humilis, erecta seu erecto-patula, puberulo-canescens, strigosa seu hispida; foliis infimis lineari-spathulatis, caeteris pectinato-pinnatifidis; *tubo calycis ad faucem dense villoso; petalis suborbiculatis integris* stamina aequantibus pistillo brevioribus; capsula ovato-seu lineari-oblonga *torulosa basi nunc in pedicellem brevissimum attenuata suberecta; seminibus magnis ovatis turgidis subobtusis varie oblique truncatis tuberculatis.* My specimens were collected by Mr. Fendler (No. 222) near Santa Fe, along waterducts, and by Dr. Hayden on the sandhills of the Loupfork, on "Running Water." Stems ½–1 foot high: flower white, turning deep red, about an inch in diameter: capsule in Fendler's specimens about an inch long, in Hayden's only about 4 lines long, thicker than in the allied species: seeds yellowish-brown, about a line long, thick, beset with tubercles arranged in longitudinal rows.

"2. ŒNOTHERA PINNATIFIDA, Nutt., Gen. 1, p. 245; Torr. & Gr. Fl. 1, p. 494. *Œ. albicaulis*, Pursh, Fl. 2, p. 733: DC. Prodr. 3, p. 51, non Nutt. *Œ. Purshii*, Don, Syst. 2, p. 668. *Œ. Purshiana*, Steud. Nom. 2, p. 207: Annua seu biennis, humilis, diffusa, (rarissime erecta), puberula, rarius sursum hirsuta; foliis imis obovato-spatulatis acutis seu obtusis integris, caeteris pinnatifidis saepe ciliatis; *tubo calycis ad faucem nudo; petalis late obcordatis seu profunde emarginatis genitalia superantibus;* capsula lanceolato-lineari *torulosa sessili suberecta; seminibus ovatis turgidis utrumque apiculatis foveolatis seriatim inter costas dispositis elegantter notatis.* Sandy soil on White River, Upper Missouri, Nuttall, Geyer in Nicollet's Expedition, Dr. Hayden; Las Vegas and Santa Fe, New Mexico, Dr. Wislizenus, Mr. Fendler; the latter's specimens, few in number, bearing his private number 239, were distributed with others of the next species under No. 223; Southern New Mexico, Wright (referred to *Œ.*

coronopifolia in Pl. Wright, 1, p. 69.) All the specimens I have seen are either annual (sometimes simple and one-flowered) or, usually, biennial, with rosulate entire radical leaves; branching from the base, diffuse or even decumbent; an erect form was collected by A. Gordon on the Upper Canadian River, No. 29, similar to the last species in habit. Stems usually 4–6 inches high, but, according to Nuttall, the decumbent branches sometimes 2 feet long. Flowers $2\frac{1}{2}$–3 inches in diameter, white, turning pale red: capsule 1–$1\frac{3}{4}$ inches long: seeds very regularly and prettily pitted between the longitudinal ribs, 0·6–0·7 of a line long, yellow. Don and Steudel have changed Nuttall's earlier name, but his must stand and Humboldt's plant, described five years later under the same name, may receive the name of *Œ. Humboldtii.*

"3. Œnothera albicaulis, Nuttall in Fras. Cat., 1813, & Gen. 1, p. 245; Torr. & Gr. Fl. 1, 495; Gray Pl. Wright 1, p. 69, & 2, p. 56: Perennis, glabra, puberula seu hirsuta; caulis *cortice albido membranaceo nitente;* foliis maxime variis; *petalis orbiculato-ovatis* in unguem plus minus attenuatis *integris* stamina superantibus pistillum aequantibus; *capsula e basi crassiore sessili lineari divaricata saepe flexuosa seu deflexa; seminibus minoribus lineari-lanceolatis laevibus.* A common plant on the western plains, extending into Oregon, New Mexico and Chihuahua, as variable in habit, growth and foliage as it is common, but always easily recognized by the unvarying characters of the flower and fruit as above indicated, and also by its white glistening stems and branches, the epidermis of which is apt to peal off in the manner of many Loasaceæ. The white flowers, $1\frac{1}{2}$–$1\frac{3}{4}$ inches in diameter, at last turn pale-red; the very slender capsule, connected by a very thick base with the stem, is usually $1\frac{1}{2}$–$1\frac{3}{4}$ inches long, and spreads at right angles, or is curved or twisted in various directions. Seeds smooth, dark-brown, lance-linear and usually very acute at one end, and 0·8 line long; var. δ, has smaller (0·6 line) and obtuse seeds. According to foliage and pubescence I arrange the specimens before me under the following varieties:

a. Foliis basi in petiolum brevem attenuatis.

Var. *α.* Nutallii: erecta, glabriuscula seu puberula, simplex seu ramosa; foliis linearibus seu lanceolatis seu oblongis integris vel plus minus dentatis. Here belongs *Œ. pallida*, Dougl., with its variety *leptophylla*, Torr. & Gr., as already indicated by Prof. Gray. Nuttall describes this form as sometimes 3 feet high, and Geyer notes that in the sandy plains of Devil's Lake and at the sources of St. Peter's River it forms shrubby bushes of the size of Spartium scoparium, growing even 4 feet high; but it seems more usually between one and two feet high. Leaves 1–$2\frac{1}{2}$ inches long and 1–6 lines wide. One of the broadest leaved forms is Fendler's N. Mex. No. 224.

Var. *β.* runcinata: branchiato-ramosa, patula, glabra, puberula seu canescens; foliis lanceolatis grosse seu sinuato-dentatis. This is *Œ. pinnatifida*, Gray Pl. Fendl., p. 43 (description and most of the specimens No. 223, all those with the private number 243). Fendler gathered it near Santa Fe; Fremont in his 3d Expedition collected a glabrous (No. 222) and a very canescent (No. 178) form, the latter with singularly short but apparently fertile capsules, scarcely 3 lines long.

b. Foliis basi lata truncata sessilibus.

Var. γ. BREVIFOLIA: tota glaberrima, erecta, ramosissima; foliis late ovatis abbreviatis grosse dentatis. Sandhills south of El Paso, Dr. Wislizenus, No. 99. Leaves dark green, while all the other forms are pale or grayish, 4–6 lines long, acutish, or often rounded at the end.

Var. δ. TRICHOCALYX: erecta, parce ramosa, canescenti-hirsuta; foliis lanceolatis seu lanceolato-oblongis sinuato-dentatis. Las Vegas, New Mexico, Dr. Wislizenus, No. 473.—This is no doubt Nuttall's *Œ. trichocalyx*, Torr. & Gr. Fl. l. c., the specific identity of which with *Œ. albicaulis* Prof. Gray has already indicated. The long hair on the stem, ovary, and especially the calyx, consists of a single cell, remarkably broad at base, tapering to an acute point;—it is however the form of hair I find in all long-haired *Œnotheræ*. G. E.

SUPPLEMENT III.—Revision of the genus *Castilleia*; by A. GRAY.

CASTILLEIA, Linn. f.

The species of this genus are most troublesome and unsatisfactory, not only on account of the difficulty of investigating the dried specimens, but also from the variability of the characters which have been relied npon in arranging them, and especially of the calyx. Although the latter affords good characters on the whole, yet the degree of fission and the form of the lobes are far from being constant in several species; and the same remark applies in a measure to the relative length of the galea and of the lower lip. The structure of the lower lip is likely to afford some good characters; but they are not readily nor very safely to be derived from dried specimens. Bentham's four sections (in De Candolle's Prodromus) do not prove to be as distinct as they would seem. The second and the third were better combined into one, which will include all our North American species but two. The fourth section is pretty well marked, but not absolutely. Of the first, which would appear to be quite distinct, I have no specimens. Beginning with Bentham's fourth section, since this comprises the original species :—

§ 1. HEMICHROMA or EUCASTILLEIA. Calyx (sæpe incurvus) antice profunde fissus, postice leviter bifidus sæpius 4-dentatus.

C. LINARIÆFOLIA, Benth., is one of the best characterized and the most northern species. It is known by its long, narrow and glabrous cauline leaves which are not dilated at the base, the floral ones scarlet-colored, by the subulate teeth of the calyx, and by the long and narrow galea, which is more slender and falcate than in *C. tenuiflora*; the lobes of the lower lip linear-subulate. But the flowers are not always sessile, nor the leaves only one-nerved and entire; these are often 3-cleft or 3-parted, and more or less distinctly 3-nerved at the base. To this species clearly belongs *C. fulgens*, Nutt. in herb. Philad., and *C. candens*, Durand in Pacif. R. R. Rep. 5, p. 12. (But No. 70 of the Californian (Fort Tejon) collection of Xantus, also specimens collected by Dr. Newberry in the Colorado expedition, which I had mistaken for *C. candens*, belong to *C. affinis*). This is No. 583 of Fendler's New Mexican collection, and 246 of Dr. Parry's Rocky Mountain collection.

C. TENUIFLORA, Benth., Pl. Hartw. No. 191, as Bentham intimates, should probably include *C. longiflora*, Kunze, and *C. canescens*, Benth., (which is Gregg's No. 434, 610, and Coulter's No. 1354), all from Mexico.

C. ORIZABÆ I have not seen, unless Coulter's No. 1352 and 1353 belong to it.

C. FISSIFOLIA, Linn. f. (No. 835, coll. Venezuel. Fendler). To this Weddell refers all the five other South American species of this section, including even *C. integrifolia*, Linn. f.

C. LAXA, Gray in Bot. Mex. Bound., p. 119, of Arizona (coll. C. Wright, No. 1490), has a broader calyx and corolla than any of its allies, the former very thin-membranaceous, colored, and with obtuse teeth, the galea slightly falcate; the leaves thin and not dilated at the insertion.

§ 2. EUCHROMA (incl. *Callichroma*). Calyx antice et postice fissus, segmentis integris emarginatis vel bifidis.

I have nothing to say of the six Mexican and South American species in the Prodromus. The proper North American ones I understand as follows:

* *Radice annua vel bienni.*

† *Integrifoliæ.*

C. AFFINIS, Hook. & Arn. Folia lineari seu lanceolato-attenuata, floralia raro trifida: flores pl. m. pedicellati: calyx usque ad medium bifidus, segmentis angustis saepius bifidis vel emarginatis: galea elongata falcata; labium brevissimum.—The calyx is generally cylindrical, more or less curved, and reddish, and the wholly exserted galea 6 to 8 lines long: but the species, I believe, passes by regular gradations into the

Var. MINOR, Gray in Bot. Mex. Bound., p. 119 (*Euchroma simplex* and *E. lanceolata*, Nutt. in herb. Acad. Philad.), which has smaller flowers, less colored floral leaves, a green and herbaceous calyx, the galea of the pale corolla only three or four lines long. Hartweg's No. 1877 is a good intermediate form. The calyx in both forms (as I have elsewhere noted) varies with its segments deeply bifid, moderately bidentate, or entire.

C. INDIVISA, Engelm. Folia caulina lineari-lanceolata, floralia obovato-dilatata rarius sublobata: flores sessiles: calycis segmenta lata sæpius emarginata; galea brevis breviter exserta. I have not the means of collating this with *C. lithospermoides*.

†† *Laciniatifoliæ.*

C. COCCINEA, Spreng. The only annual, or perhaps biennial, species with laciniately cleft leaves; confined to North America east of the Rocky Mountains, and mostly east of the great plains, ranging from Rupert's Land to Texas.

* * *Radice perenni.*

† *Foliis floralibus superne pl. m. dilatatis et coloratis.*

†† *Villoso-pubentes, vel inferne glabræ, pube versus apicem caulis, etc., patente pilosa vel hirsuta sæpius viscosa.*

C. PARVIFLORA, Bongard. Fere undique piloso-pubescens vel hirsuta, vix hispida: folia pleraque trifida vel pinnato-laciniata, floralibus apice sæpissime rubro-colorata: calycis segmenta aut emarginato-biloba, aut profunde bifida lobis oblongis seu linearibus: corollæ labium brevissimum.

—This is apparently the commonest species and of widest range west of the Rocky Mountains, extending from Russian America to Southern California. The name given by Bongard is much the earliest, but not a good one, being founded upon what, I believe, is only a northern form of Bentham's *C. hispida* (a later and scarcely more appropriate name), with a less developed corolla. The length of the galea appears to be subject to variation in this species, as in *C. pallida*, and the calyx-segments still more so. To the present species may be referred: *C. coccinea*, Lindl. Bot. Reg. t. 1136 (non Spreng.), which, as its calyx-segments are described as being dilated and retuse, Mr. Bentham should rather have referred to his *C. Douglasii*. *Euchroma angustifolia* and *E. Bradburii*, Nutt.! in Jour. Acad. Philad. 7, p. 44, 47 (1834), both hirsute forms with deeply cleft and narrow calyx-segments. *Castilleia hispida*, Benth. in Hook. Fl. Bor. Am. & in DC. Prodr., 10, p. 532. *C. Douglasii*, Benth. in DC. l. c. p. 530; the commoner form, with oblong or more dilated and slightly lobed or cleft calyx-segments. *C. desertorum*, Geyer in Hook. Kew Jour. Bot. 5, p. 258, which is just Nuttall's *E. angustifolia*, but with partly yellow bracts. *E. macrocalyx*, *E. villosa*, *E. luciniata*, and *E. viscosa*, Nutt. in herb. Acad. Philad.

C. PALLIDA, Kunth. Inferne sæpius glabra vel glabrata, caule versus apicem calycibusque villosis: folia inferiora sæpissime integra (e forma lineari ad ovato-lanceolatam), floralia vulgo pl. m. incisa vel laciniata et albido-colorata: calycis segmenta bifida seu biloba: galea aut breviuscula aut elongata.—The most northern species, and extending round the world on the borders of the arctic zone. I am well satisfied (especially from White Mountain specimens, clearly all of one species) that the galea varies much in length or degree of development,—the lower lip remaining nearly uniform,—and that, accordingly, *C. Sibirica* and *C. septentrionalis* of Lindley are states of one species, *C. pallida*,—to which belong *C. acuminata*, Spreng. (*Bartsia acuminata*, Pursh), *C. occidentalis*, Torr. (a dwarf alpine form), *Euchroma lutescens*, Nutt. in herb. Acad. Philad., and, as a variety:—

Var. MINIATA: viridior, inferne glabra; foliis floralibus pl. m. miniatis; galea elongata magis exserta. *C. miniata*, Dougl., Benth. *Euchroma integrifolia*, Nutt. in herb. Hook. & Acad. Philad. This is pretty well marked on the whole; but in Rocky Mountain specimens it runs both into *pallida* and *septentrionalis*. As to "*C. pallida* var. *Unalaschensis*, Cham. and Schlecht.," from Sitcha, my specimens from Bongard consist of narrow-leaved ones with a short galea (true *C. pallida*) and a broader-leaved one with elongated galea, good *C. septentrionalis*, apparently, referred by Bentham to *C. miniata*. C. No. 1, Bourgeau's coll. in Palliser's Exped., is *C. miniata* with the upper cauline and floral leaves unusually cleft.

C. LATIFOLIA, Hook. & Arn. Undique viscoso-hirsuta, laxe ramosa: folia brevia, obovata, obtusissima, plerisque integra, floralia apice dilatata, 3–5-lobata, rubro-colorata: calycis segmenta lata emarginato-biloba: corolla parva. A well-marked Californian species. The comparatively short and broad calyx is sometimes equally cleft before and behind, sometimes much deeper posteriorly.

++++ *Tomentosæ, vel pube caulis molli implexa. Folia caulina linearia integra, vel trifida.*

a. Incanæ ; calycis segmentis dilatatis subintegris.

C. FOLIOLOSA, Hook. & Arn. Floccoso-tomentosa, tomento e pilis ramosissimis ! Caules suffruticosi cum foliis adultis quandoque glabrescentes : galea ultra segmenta calycis spathulato-oblonga sæpius retusa leviter exserta.—The peculiarity of the pubescence is indicated in Bot. Mex. Bound. Survey, p. 118.

C. LANATA, Gray in Bot. Mex. Bound., l. c. Herbacea, tomento arachnoideo appresso albo-lanata : flores fere *C. foliosæ*, sed majores.

b. Cinereo-puberulæ vel subtomentosæ ; calycis segmentis sæpissime bifidis ; galea exserta. Folia supra nunc glabra.

C. INTEGRA, Gray in Bot. Mex. Bound. l. c. Caulis laxe tomentosus : folia (sæpius tomentulosa) omnia integerrima, vel floralia sublobata, raro trifida : flores sesquipollicares, galea majore et labio breviore quam *C. purpureæ.*—Besides the numbers already cited, this is No. 244 of Parry's Rocky Mountain collection (a dwarf or subalpine form); and my *C. tomentosa*, from Mabibi, Arizona, Thurber, appears to be a more tomentose state of the same species, the flowers in the specimen not well developed. It is closely related to *C. purpurea*, and perhaps runs into it. To that, at least, I now refer the undistributed specimens of Wright's first collection.

C. PURPUREA, Don. Caulis tomentulosus vel cinereus : folia pubera vel glabrata, superiora vulgo cum floralibus trifida seu laciniata : flores pollicares, labio minus quam in affinibus abbreviato (2–2½ lin. longo). Floral leaves varying from cherry-red to flesh-color, or light yellow. Lower lip of the corolla by no means half the length of the galea in well developed flowers. To this species belongs *C. angustifolia*, Gray in Bot. Mex. Bound. l. c., excluding the synonymy, and excluding the plant of H. Engelmann from Bridger's Pass, the latter being *C. miniata.* It is, accordingly, Wright's No. 1491 and 1492, and Lindheimer's 488 and 669.

++ Foliis (plerisque 3–5-fidis lobis linearibus) floralibus apice nec dilatatis nec coloratis. Calyx aut æqualiter aut antice profundius fissus, segmentis alte bifidis. Corollæ labium mayis quam in cæteris *trisaccato-carinatum, lobis galeæ dimidium adæquantibus. Plantæ humiles, subvillosæ vel subcinereæ.*

C. SESSILIFLORA, Pursh. Calyx et corolla tubo elongato angusto ; labio tripartito, lobis lineari-lanceolatis. Corolla evoluta bipollicaris, galea 4–6 lin. longa.

C. BREVIFLORA, Gray, Pl. Parry, No. 243. (*Euchroma breviflora*, Nutt. in herb. Philad.) Spithamæa, spica densa, florescente vix pollicari ; calyce ovoideo-oblongo, lobis lanceolatis ; corollæ luteæ tubo fere incluso, labio inferiore triplicato-saccato breviter trifido, lobis oblongis obtusis.—Rocky Mountains, Nuttall, Parry, No. 243. A well-marked species of this genus ; the lip of the corolla about as long in proportion to the galea as in *C. sessiliflora*, but more trisaccate,—therefore one of the transitions to *Orthocarpus*. The calyx in flowers of the same spike is sometimes about equally cleft behind and before, and sometimes split in front while the posterior cleft is no deeper than that between the lateral lobes.

Excludendæ. Small indeed are the absolute distinctions between some of the third section of *Orthocarpus* and *Castilleia.*

Euchroma albida, Nutt. in herb. Acad. Philad., is *Orthocarpus attenuatus*, Gray in Bot. Whippl. Exped. Pacif. R. R. Rep. 4, p. 121. This is the "O. No. 1," of Dr. Lyall's collection on the Oregon Boundary, from Lopez Island, distributed at Kew Gardens.

Euchroma pallescens, Nutt. in herb. Acad. Philad., from the Rocky Mountains, being a near relative of the preceding and of *Orthocarpus densiflorus*, and I believe not a described species, would take the name of *O. pallescens*. The lobes of the lower lip of the corolla are so conspicuous that it can hardly be *O. hispidus*, Benth., a species unknown to me. The segments of the deeply two-cleft calyx are merely bifid at their apex. Near to this, if not the same, but more hairy, with deeper-cleft calyx-segments, and yellowish corolla almost an inch long, are specimens of Geyer's Rocky Mountain collection, distributed as No. 291, therefore probably those mentioned in Hook. Kew Jour. Bot. 5, p. 259. Here also the lobes of the lower lip are quite conspicuous, and the incompletely developed specimens might very readily be taken for those of a *Castilleia*.

SUPPLEMENT IV.—Review of the genus *Mertensia*; by A. GRAY.

MERTENSIA, Roth.

The species of *Mertensia* which I have been able to examine, although not a little perplexing, may perhaps be best discriminated as follows:—

§ 1. Filamenta gracilia antheris multo longiora: corollæ tubo calyce alte 5-fido pluries longiore, limbo levissime lobato, plicis faucialibus nullis. Tota glaberrima.

1. M. VIRGINICA, DC.—The disk is annular, but on each side developed into a large lobe or glandular appendage. That of *M. Fendleri* and of some specimens of *M. paniculata* approaches it. Corolla villous inside just above the obscurely 10-glandular base of the tube.

§ 2. Filamenta antheris plus minus angustiora et longiora: corollæ limbo lobato.

2. M. MARITIMA, Don. Corollæ tubo limbo breviore calycem sub-5-partitum subæquante, plicis conspicuis.

3. M. PALLASSII, Don. *M. Sibirica*, DC., &c. *Pulmonaria Sibirica*, Pall., non Linn. *Lithospermum Pallassi*, Ledeb. Corollæ tubo limbo 1½–2-plo calyce 3-plo longiore, plicis tenuibus. Siberia.

§ 3. Filamenta magis dilatata, antheris æquilata seu latiora et plus minus breviora: corollæ limbo 5-fido.

* *Calyx haud ultra medium 5-fidus.*

4. M. FENDLERI (sp. nov.): foliis subtus cauleque lævibus supra cum pedicellis appresse hispidulis, caulinis oblongo-lanceolatis; racemis paucifloris; corollæ tubo lobis calycis hirsuti lato-lanceolatis limboque vix longiore intus supra basim annulato-villoso. New Mexico: foot of hills on Santa Fe Creek, Fendler No. 625. Discus pl. m. bilobus.

* * *Calyx* 5-*partitus, in M. oblongifolia et M. alpina quandoque alte* 5-*fidus.*

— *Corolla tubo quam limbus* (*i. e. pars dilatata supra faucem*) 2–3-*plo longiore.*

5. M. Davurica, Don. Gracilis; foliis caulinis linearibus supra cum calyce subincano-hirtis; corolla ima basi annulato-pilosa, cæt. glabra. Siberia. The hairy ring (much less conspicuous than that of the foregoing species) is here at the very base of the corolla, occupying the position in which ten obscure glands or slight thickened spots are generally discernable: these are most evident in the following species, and in *M. alpina.*

6. M. oblongifolia, DC., Hook. Kew Jour. Bot. 3, p. 295. *Pulmonaria oblongifolia*, Nutt.! *Lithospermum marginatum*, Lehm. in Hook. Fl. Bor. Am. Humilis; foliis caulinis oblongis vel spathulato-lanceolatis plerumque obtusis; segmentis calycis lanceolatis seu linearibus acutis corollæ tubo intus glaberrimo 2–3-plo brevioribus. Interior of Oregon, Utah, &c. Varies with the sepals very narrow and ciliate with long and rigid bristles, as in Nuttall's original specimens collected by Wyeth; or with these ciliæ minute or sparse or obsolete, as in most specimens; in Geyer's No. 316, the calyx is hardly 5-parted, and its segments broader; in Spalding's, from Clear Water, the leaves are unusually broad. The leaves resemble those of Heliotropium Curassavicum.

— — *Corolla tubo quam limbus ad summum sesquilongiore.*

— — *Elatæ*, 1–3-*pedales : folia caulina ovata seu ovato-lanceolata, acutissime acuminata vel acutata, costato-venosa ; corollæ semipollicares seu paullo longiores.*

7. M. paniculata, Don. *M. paniculata, pilosa, pubescens, lanceolata? stylosa?* & *Kamtschatica?* DC. Hirsuta, hirtula, vel glabrata; segmentis calycis lanceolatis seu lanceolato-linearibus acutis hirsutis vel hispido-ciliatis tubo corollæ intus sparsim piloso paullo vel dimidio brevioribus.—A specimen of *L. denticulatum*, Hook. & Arn. from Kotzebue's Sound in Beechey's Voyage, p. 128, in herb. Torr., is certainly of this species, which probably occurs in Northeastern Asia also. H. Engelmann's specimens from Medicine-Bow Mountains and Dr. Parry's No. 286 are glabrate and dwarf mountain forms of *M. paniculata*, with barely acute leaves, and are Pursh's *Pulmonaria lanceolata*. Nuttall's *P. marginata* is much the same.

8. M. Sibirica, Don, non DC. *M. denticulata* (Don.) & *ciliata*, DC. (*Pulm. Sibirica*, Linn.) Glaucescens, subpubescens, vel glabra; segmentis calycis oblongis seu oblongo-linearibus obtusis ciliolatis tubo corollæ intus sparsim piloso vel fere glabro 2–4-plo brevioribus. Rocky Mountains, Eastern Siberia.

— — *Pumila : folia caulina obtusa vel acutiuscula, vix venosa : corollæ* $\frac{1}{4}$–$\frac{1}{8}$-*pollicares.*

9. M. alpina, Don. *M. Drummondii*, Don. *Pulmonaria alpina*, Torr. *Lithospermum Drummondii*, Lehm., in Hook. Fl. Bor.-Am. Spithamæa ad subpedalem; foliis spathulato-oblongis lanceolatis vel supremis oblongo-ovatis parvulis; segmentis calycis nunc ovato seu oblongo-lanceolatis obtusiusculis nunc lineari-lanceolatis acutis ciliatis corollæ tubo limbum

see Gray Manuag 1874 under M. alpina
in "Heterocarya extra-Boja"

adæquante paullo brevioribus.—Either glabrous or hirsute. Richardson's plant from the arctic coast is a large-flowered form of Torrey's *P. alpina*. Parry has an alpine form (No. 287), and a loose, evolute form with longer and narrower leaves (No. 284); in these the tube of the corolla is usually pilose inside near the middle; but it is not so in Torrey's original specimens of *M. alpina*, nor in Hooker's *M. Drummondii*. In the latter, and in Parry's specimens, as in all of the various other species I have examined, the stamens are inserted in the throat of the corolla. In the flowers of Dr. James' specimens, they are inserted pretty low down on the tube, so that the tips of the anthers barely reach to the level of the faucial plicæ or appendages. This is the case in all the various specimens I have examined (of Burke, Fremont, and Stansbury) from the western side of the Rocky Mountains, of what seems to be a narrow-leaved and hirsute variety of this species. Contrary, however, to the dimorphism in other *Borragineæ*, *Rubiaceæ*, &c., the included stamens are here accompanied by a *short* style.

§ 4. Filamenta antheris sublongiora et equilata: corollæ limbo lobato: achenia echinata!

10. M. RIVULARIS, DC. *M. elliptica*, Ledeb. ex Regel & Tiling, Fl. Ajan. N.E. Siberia and Kamtschatka. Corolla with the tube hairy within towards the base: plicæ at the throat conspicuous. I have only a specimen from Tiling's Ajan collection. In this the fruit is conspicuously *echinate* with soft prickles,—a remarkable peculiarity, which is not noticed in Regel's account of this collection.

*** Dr. Hooker, in his Arctic Essay, received long since the above was written, adopting Sir William's suggestion, refers the high arctic *M. Drummondii* (*Lithospermum Drummondii*) to our *M. Virginica*. Although Lehmann describes the corolla "*fauce notata protuberantiis quinque*, I found no appendages in an original specimen in herb. Torrey, just as Dr. Hooker notes. But I also found them obsolete in specimens of *M. alpina* and of other species in which they are sometimes evident. Wherefore I rejected the character from the diagnosis of Section 3.

From the Author

from Proceedings of the Academy

of

March 1863

Enumeration of the Species of PLANTS collected by Dr. C. C. Parry, and Messrs. Elihu Hall and J. P. Harbour, during the Summer and Autumn of 1862, on and near the Rocky Mountains, in Colorado Territory, lat. 39°—41°.

BY ASA GRAY.

An interesting account by Dr. Parry of his first explorations of the Rocky Mountains in Colorado Territory, made in the summer of 1861, was published in the American Journal of Science and Arts, vol. 33, 1862. This was followed by an enumeration of the plants in the choice botanical collection which he made, as determined by myself, Dr. Engelmann and others. The importance of this pioneer exploration, both in a physico-geographical and a botanical point of view, decided Dr. Parry to repeat and extend it the following year, to undertake more full and exact observations upon the configuration of the district, and the altitude of the loftier peaks, and to secure a larger botanical collection. In the latter view, Dr. Parry was joined by two zealous and enterprising botanical companions, Messrs. Hall and Harbour, of Illinois, who devoted their entire energies to the collection of plants. The botanical collection, accordingly, through these conjoint labors and explorations, is full, excellent, and of great interest. Along with a fair proportion of species new to science or new to the region, it brings to light and makes accessible to botanists generally, many of the late Mr. Nuttall's discoveries made almost thirty years ago, and even some of those of his first journey up the Missouri, almost half a century ago, authentic specimens of which hardly exist, except in the herbarium of the Academy, in that of Mr. Durand, at Philadelphia, and in the Hookerian herbarium at Kew.

It is in this regard, namely, on account of the intimate association of the name and scientific career of Nuttall with Philadelphia, and especially with the Academy of Natural Sciences,—the publisher of many of his botanical writings, and the proprietor of his principal botanical collections,—that I have deemed it peculiarly proper to offer the following enumeration for publication in the Academy's Proceedings.

This enumeration is but a *reconnoissance* of the collection in hand. It might have been much extended by descriptions, remarks, and references; and some of the determinations may probably have to be reconsidered. But I deem it best for our science to publish it at once, as it is, that it may be early in the hands of botanists along with the distributed sets of specimens, thus enhancing the usefulness of the collection, and affording the widest opportunity for the prompt correction of oversights, omissions, or mistakes on my part, of which there may be not a few.

It should be remarked that the general collection, although made by the three associates conjointly, is distributed under the tickets of Messrs. Hall and Harbour,—upon whom indeed the labor of the collection more immediately devolved,—and is numbered quite independently of Dr. Parry's collection of 1861, thus avoiding all danger of confusion between the two. But a small separate collection made by Dr. Parry late in the summer, at stations visited by himself alone, which supplements or helps out the general collection, bears Dr. Parry's numbers of the former year, (which, being already published, are here mentioned only when there is some occasion for it,) or, when of plants not in that collection, the numbers are in continuation of it,—viz.: 398, 399, and so on. Reference to these additional numbers is chiefly made in foot-notes, to which also the characters of new species, &c., are consigned.

The plants were numbered and distributed into sets by Messrs. Hall and Harbour before they were seen by me, and a full set was supplied to me for examination, which serves as a basis for the following list. This accounts for a few misplacements, and also for the occasional mixture of two species

under the same number ; which, under the circumstances, it was not easy altogether to avoid. The collectors appear to have been somewhat too fearful of distributing the same species under two or more numbers ; but the opposite course, in case of doubt, is preferable. Even well-marked varieties had better be kept separate in distributed collections.

ENUMERATION.

RANUNCULACEÆ.

1. ATRAGENE ALPINA, L. 2. CLEMATIS DOUGLASII, Hook. 3. C. LIGUSTICIFOLIA, Nutt. 4. PULSATILLA NUTTALLIANA, Gray, which I am now convinced is properly referred to *P. patens*, and especially by Regel to his var. *Wolfgangiana*. Some of the specimens are very large and fine. 5. ANEMONE MULTIFIDA, DC., both red and white-flowered. 6. A. CAROLINIANA, Walt. ; on the plains. 7. A. NARCISSIFLORA, L., from the alpine region ; not before known this side of Russian America ; fine specimens, with the flowers only three, two, or one to the involucre. 8. THALICTRUM FENDLERI, Engelm. ; the diagnosis noted in the Enum. Pl. Parry, p. 12, and now the species itself is obtained, "on low mountains." 9. T. SPARSIFLORUM, Turcz.,* in fruit, "the whole plant with a very heavy narcotic odor," according to Dr. Parry. 10. T. ALPINUM, L., large specimens. 11. RANUNCULUS CYMBALARIA, Pursh. 12. R. HYPERBOREUS, Rottb. var. *natans*, C. A. Mey. "In water or in swamps, at middle elevations in the mountains, or subalpine ;" from the station and from the size of the plants so much approaching the small and emersed form of *R. Purshii* var. *repens*, Hook., (*R. Gmelini*, DC., of which a few specimens were also collected,) that it might belong to that species except for the want of a style ; mature fruit not collected. 13. R. (CYRTORRHYNCHA) NUTTALLII, the very rare *Cyrtorrhyncha ranunculina*. Nutt. in Torr. and Gray Fl., which is rightly determined by Bentham and Hooker to have the ovule erect, and therefore to be a Ranunculus, notwithstanding the nervose achenia.† 14. R. ESCHSCHOLTZII, Schlecht., Hook. ; same as the broader-leaved specimens of Parry's No. 80 ; has glabrous peduncles, smaller flowers, and shorter styles than *R. nivalis*, but Greenland specimens of Vahl's collection approach it. 15. R. AFFINIS, R. Br. var. *leiocarpus*, Trautv. : the same as narrow-leaved specimens mixed last year with Dr. Parry's No. 80 (vide Sill. Jour., 33, p. 404) ; may be a form of *R. auricomus* if that ever has glabrous achenia, but they compose a rather oblong or cylindraceous head. 16. R. AFFINIS, var. *cardiophyllus*. (*R. cardiophyllus*, Hook.) The flowering specimens, with their cordate-rotund radical leaves, villous pubescence and large flowers (the corolla a full inch in diameter) perfectly accord with Hooker's figure, except that the stature is dwarf, and the young carpels show a rather long style, as figured; but accompanying fruiting specimens wholly accord with *R. affinis*. 17. R. ADONEUS, n. sp.,‡ No. 81, of last year's collection of Dr. Parry, who has now supplied the fruit ; and the species proves to be a new and peculiar, handsome and strictly alpine one.§ 18. R. FLAMMULA, L.,

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*Dr. Regel's note under this species, in his elaborate revision of *Thalictrum*, is founded on a misreading of my foot-note in Pl. Wright, 2, p. 8, where to *T. sparsiflorum* is referred *T. clavatum*, Hook., *non* DC. The Candollean species is wholly different, and a native only of the mountains of Carolina.

† RANUNCULUS (CYRTORRHYNCHA : petala supra basim *callosa* : stylus *incurvus*, stigma apiculatum : achenia turgida multinervosa) NUTTALLII : glaber, semipedalis ; radice fasciculata ; foliis radicalibus biternatisectis, segmentis 3–5-partitis, lobis oblongis linearibusve nunc 2–3-fidis ; ramis folio parvo subtensis paucifloris ; petalis spathulatis sepala latiora etiam flava paullo superantibus ; stylo longo gracili ; achenis majusculis subpaucis in capitulum globosum collectis. Eastern side of the Rocky Mountains ; Independence Rock on the Sweet Water of the Platte. Nuttall.

‡ Mixed in some sets, I fear, with a little of *R. Eschholtzii* or of the real *R. nivalis*.

§ RANUNCULUS ADONEUS, (sp. nov.,: humilis, villo parco deciduo glabratus ; radice fasciculato-fibrosa ; caulibus basi ramentaceis superne 1–3-foliatis nunc erectis simplicissimis unifloris nunc sarmentoso-decumbentibus 2–3-floris ; foliis bipedato-partitis segmentis anguste linearibus, petiolis basi scarioso-dilatatis ; pedunculo brevi ; corolla aurea eximia (plerumque ultra pollicem diametro ;) petalis flabelliformibus sepalis ovalibus subvillosis duplo longioribus, squamula ba-

var. *reptans*. 19. R. An ambiguous little plant from the alpine region, which might be mistaken for a smaller form of Parry's 79.* 20. MYOSURUS MINIMUS, L., from South Park, with somewhat more of a beak to the achenia than in Eastern or European specimens. 21. CALTHA LEPTOSEPALA, DC. 22. TROLLIUS LAXUS, Salisb. var. *albiflorus*, Gray, in Sill. Jour. 33: well-developed specimens. Divisions of the leaves less deeply incised than in the Eastern U. S. plant. 23. AQUILEGIA VULGARIS, var. *brevistyla*. 24. A. CERULEA, Torr., equally beautiful with the specimens of last year. 25. DELPHINIUM ELATUM, L., var., Parry's No. 84. 26. D. SCOPULORUM, Gray. 27. A high alpine form of the last. 28. D. MENZIESII, DC.: but if collected east of the Mississippi might be taken for *D. tricorne*. 29. ACONITUM NASUTUM, Fisch.; white and blue, as in Parry's 86.

BERBERIDACEÆ.

30. BERBERIS (MAHONIA) AQUIFOLIUM, Pursh, var. *repens*.

FUMARIACEÆ.†

31. CORYDALIS AUREA, Willd., var. CERVISIBIQUA (*C. curvisiliqua*, Engelm.), the same as Wright's No. 1309.

CRUCIFERÆ.

32. NASTURTIUM OBTUSUM, Nutt. 33. CARDAMINE HIRSUTA, L. 34. C. CORDIFOLIA, Gray.‡ 35. STREPTANTHUS ANGUSTIFOLIUS, Nutt.; probably a form of S. SAGITTATUS, Nutt. 36. TURRITIS PATULA, Graham. 37. SISYMBRIUM VIRGATUM, Nutt., but from the silique rather an *Erysimum*. 38. ERYSIMUM CHEIRANTHOIDES, L. 39. E. PUMILUM, Nutt., (which I suppose is also *E. lanceolatum*, R. Br., of the Old World,) as to the fruiting alpine specimens, along with forms of E. ASPERUM, DC., with large flowers (*E. Arkansanum*). The collectors think these are all forms of one species. 40. SYSIMBRIUM SOPHIA, L. (including *S. canescens*, Nutt.), both a smoothish form, with short pedicels and short pods, (*S. brachycarpum*, Richards.), and also with slender pods, and the whole herbage viscid with glandular pubescence — one of the forms of *S. incisum*, Engelm. 41. DRABA CRASSIFOLIA, Graham; which, in Parry's former collection, No. 53, I named *Draba Johannis*, but it proves to have yellow flowers.§ With it is mixed a very little *D. stellata*, var. *hebecarpa*, as the species are

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silari pervadnata: achemis in capitulum ovale digestis levibus turgidis, rostro longiusculo ensiformi attingue scariosa-alato! In the high alpine region, close to the snow. In Dr. Parry's specimens of last collected later in the season,—with some mature fruit, and with some of the stems becoming procumbent or runner-like, and producing a flowering shoot from the axils of the cauline leaves,—enough to characterize this remarkable species. In the early state it bears some resemblance to *Draba nivalis*. The scarious wings of the style are sometimes decurrent on the achenium. Also, again, often has a distinct hyaline wing around the base. Notwithstanding the yellow flowers, the affinity of the species is probably with *R. glacialis*, the carpel and style of which is said to be wing-margined. The corolla is usually large and full.

* This, from better specimens collected this year, confirms Mr. Black's opinion that it is a dwarf *R. affinis*; but the upper cauline leaf is often three parted, and the achenia have a small short beak, and are puberulent: the three-parted leaf, the puberulent achenia and the large flower separate it from *R. pedatifida* var. *reptans*: and the mostly entire and narrow leaves, the glandular head of carpels and the depauperate size (2 or 3 inches, from *R. affinis*, of which it has the achenia. I have seen only a single specimen.

† PAPAVER ALPINUM, L., was again collected by Dr. Parry, No. 147.

‡ This species, which in its characters well,—when described, was compared with our *C. rhomboidea* and *C. hirsuta* on the one hand, and on the other with the Lapland *Cardamine bellidifolia*, which, so far as my means of comparison extend, appears to belong to *C. asarifolia*. The collections bearing upon questions of geographical distribution in species,—viz.: as to the probable affinities of *C. asarifolia*, *angulata*, *cordifolia*, *rhomboidea* and *hirsuta*.

§ Specimens of this were sent by me to Dr. Hooker, to ask his opinion. He replies: "It is *Draba Johannis* of Europe, according to Mr. Babington, except that the flower is yellow. It is certainly also *D. crassifolia*, Graham, from Rocky Mountains, Drummond, and evidently the same as *D. Fladnitzensis*, Walp., and *D. lutea*, Adams. *D. pygmæa*, Turcz., and a host of others."

regarded by Regel, i. e., *D. muricella*, Vahl., with pubescent silicles, and a smooth form of *D. nemoralis*. 42. D. NEMORALIS, L., two pubescent forms. 44. D. ARCTICA, Vahl. 45. D. STREPTOCARPA, Gray, Enum. Pl. Parry, p. 13, No. 95, with some reduced, high alpine forms, in which the silicle does not always twist. 43. SMELOWSKIA CALYCINA, C. A. Meyer, (*Hutchinsia*, Desv.) High alpine. 46. THLASPI COCHLEARIFORME, DC. Common at all heights. 47. PHYSARIA DIDYMOCARPA, Gray, var.? The same as Parry's 101, but more hoary, and with a longer slender style. Mature fruit and seeds being still wanting, it yet remains as doubtful as before whether this is a form of Hooker's species. 48. VESICARIA LUDOVICIANA, DC. 49. VESICARIA MONTANA, n. sp.,* from the middle mountains; also collected last year at Eureka by Mr. Howard, but without fruit. 50. STANLEYA INTEGRIFOLIA, James. 51. THELYPODIUM (PACHYPODIUM, Nutt.) INTEGRIFOLIUM, Torr. and Gray.

CAPPARIDACEÆ.

52. CLEOME INTEGRIFOLIA, Torr. & Gray. 53. CLEOMELLA TENUIFOLIA, Torr.

VIOLACEÆ.

54. VIOLA BIFLORA, L. 55. V. NUTTALLII, Pursh. 56. V. MUHLENBERGII, var. *pubescens*, same as 108 of Parry. 57. IONIDIUM LINEARE, Torr.

PARNASSIEÆ.

575. PARNASSIA PARVIFLORA, DC., Hook. Two forms of the species, into which *P. Kotzebuei*, Cham., probably passes. It is No. 427 of Dr. Parry. 578. P. FIMBRIATA, Banks; a small form of the species; the flowers only half the size of those of the ordinary state. It is No. 428 of Parry's separate collection.

HYPERICACEÆ.

58. HYPERICUM SCOULERI, Hook., which apparently is also *H. formosum*, HBK.

ELATINACEÆ.

59. ELATINE AMERICANA, Arn. On the Platte River. (60. See Primulaceæ.)

CARYOPHYLLACEÆ.

61. SILENE SCOULERI, Hook. 62. S. DRUMMONDII, Hook. 63. LYCHNIS APETALA, L. vars., same as 132 and 133 of Parry. 64. SILENE MENZIESII, Hook. 65. SILENE ACAULIS, L.

66. PARONYCHIA PULVINATA, n. sp.,† the same as Parry's 297, of which he also has collected very fine specimens this year. 67. P. JAMESII, Torr. and Gray. 68. SAGINA LINNÆI, Presl. 69. ARENARIA (ALSINE) ROSSII, R. Br., the taller stems 3–5-flowered, pretty clearly a mere arctic-alpine form of *A.*

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*VESICARIA MONTANA (sp. nov.): argenteo-incana: caulibus e radice perenni diffusis foliosis; foliis spathulatis, radicalibus subbovatis petiolatis rarius 1–2-dentatis; racemis fructifero elongato; siliculâ ovali seu ellipsoideâ cano-pubescente stylo gracili longiore pedicello patente sursum curvato paullo breviore. Habit of *V. Ludoviciana*, *argyræa*, and *argentea*: well marked by the oval or oblong silicle which is, in some specimens, 5 lines in length, but of scarcely half that breadth, while in others it is shorter and broader, barely oval in outline,, hoary, with a fine stellular pubescence, one-third longer than the style, commonly one-third or one-half longer than the pedicel, nearly terete; the valves of the same rather thin texture as those of *V. Ludoviciana*, more convex than those of *V. alpina*. Seeds four or six in each cell, wingless. Petals spatulate, light yellow. Filaments filiform.

†PARONYCHIA PULVINATA (sp. nov.): depressa, e caudice lignescente pulvinato-cæspitosa, fere glabra: stipulis argenteis ovatis integris acutis; foliis oblonga obtusa margine ciliato-scabra subæquantibus cum iis ramos breves usque ad florem terminalem sessilem dense vestientibus; calycis segmentis ovalibus late scariosis sub apice cucullato aristulatis, aristula cucullum vix superante. In the high alpine region, quite common. Forming dense, cushion-like tufts, apparently like those of *Silene acaulis*, denser than those of *P. sessiliflora*, Nutt. Stipules 2 lines long, broadly ovate and obtuse, or the uppermost somewhat taper-pointed or acute, but mutic-ous. Leaves 2½ or 3 lines long, about a line wide, bright green, flat, thick, very obtuse and mutic-ous, nerveless. Flower solitary and immersed among the leaves. Staminodia 5, similar to the fertile filaments. Ovary glabrous, tapering into the rather short style.

uliginosa, Schleich. (*Alsine stricta*, Wahl.) 77. A. ARCTICA, Stev., the same form as Parry's 141; and with it specimens of *A. biflora*, Wahl., var. *carnulosa*, Fenzl., with flaccid procumbent stems, and longer, lax, falcate leaves. If forms of the same, then *A. arctica* and *biflora* are properly united by Dr. Hooker. 79. **A. FENDLERI, Gray.**

70. STELLARIA UMBELLATA, Turcz.? An ambiguous form, of the alpine region, with the capsules, seeds, and scarious bracts of *S. longifolia*, but with oblong, flaccid leaves, and petals wanting.* 73. From middle elevations, is a form of the same, without fruit. *S. alpestris*, var. *paniculata*, Fries, Herb. Norm., is perhaps the same, or a form connecting it with *S. longifolia*, but his *S. alpestris* var. *aliflora* is *S. borealis*. 71 and 76. S. LONGIPES, Goldie. 72. S. BOREALIS, Bigel., except the depauperate young specimens intermixed, which are the same as 70. 78. S. JAMESII, Torr. 74. MŒHRINGIA LATERIFLORA, Fenzl. 75. CERASTIUM ARVENSE, L., mixed with *C. vulgatum?* var. *Behringianum*, or *alpinum*, just as was Parry's No. 138 last year. (80. See under Scrophulariaceæ.)

PORTULACACEÆ.

81. TALINUM PARVIFLORUM, Nutt., or perhaps *teretifolium*, as the specimens are only in fruit. 82. CLAYTONIA VIRGINICA, L., from the alpine region. 83. C. ARCTICA? var. *megarhiza*, Gray, Enum. Pl. Parry (*C. megarrhiza*, Parry); specimens smaller than last year. 84. CLAYTONIA CHAMISSONIS, Esch. (*C. aquatica*, Nutt.); more luxuriant than the plant of Unalaschka, but otherwise similar: petals rose-color. (Dr. Parry again collected TALINUM PYGMÆUM, Gray, his No. 143.)

MALVACEÆ.

85. SIDALCEA CANDIDA, Gray. Cold springs, &c., on Blue River.† 86. MALVASTRUM COCCINEUM, Gray.

LINACEÆ.

87. LINUM PERENNE, L.

GERANIACEÆ.

88. GERANIUM RICHARDSONII, F. & M., the same as 112 of Parry. 89. G. FREMONTII, Torr., var. *Parryi*, Engelm., the same as Parry's 113, the fruiting pedicels divaricate!

RHAMNACEÆ.

90. CEANOTHUS FENDLERI, Gray. 91. C. OVATUS, Desf.

CELASTRACEÆ.

92. PACHYSTIMA MYRSINITES, Raf.

SAPINDACEÆ (ACERACEÆ.)

93. ACER GLABRUM, Torr., the ordinary form of the species.

LEGUMINOSÆ.

94. LUPINUS PUSILLUS, Pursh. 95. L. ORNATUS, Dougl.: "abundant at low and middle elevations." Very ornamental. 96. L. CÆSPITOSUS, Nutt., probably a form of *L. aridus*, Dougl. The keel is slightly ciliate. It was found "on Blue River, west of the range." 97. TRIFOLIUM DASYPHYLLUM, Torr. and Gr. Still finer and larger specimens than last year. 98. T. PARRYI, Gray, Enum. Pl. Parry.‡ 99. T. NANUM, Torr. 100. DALEA LAXIFLORA, Pursh.

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* Dr. Parry also separately collected it, in fine fruiting specimens, in sub-alpine woods, on Mad Creek, &c., No. 431.

† This rare species was separately collected in Middle Park, by Dr. Parry. It is his No. 429. SIDALCEA MALVÆFLORA, Gray. (*S. Neo-Mexicana*, Gray,) Parry's 430, was collected with the last.

‡ TRIFOLIUM LONGIPES, Nutt. Sparingly collected by Dr. Parry in Middle Park, and distributed as his No. 434.

101. PSORALEA LANCEOLATA, Pursh. 102. P. FLORIBUNDA, Nutt. 103. P. ARGOPHYLLA, Pursh. 104. DALEA ALOPECUROIDES, Willd. 105. PETALOSTEMON MACROSTACHYUS, Torr. 106. ASTRAGALUS KENTROPHYTA (*Kentrophyta montana*, Nutt.) 107. THERMOPSIS RHOMBIFOLIA, Nutt. (the smaller plant and the fruit), and apparently T. FABACEA, var. *montana*, Gray (*T. montana*, Nutt.): the latter should be known by its taller stems, larger leaflets, and narrow, linear, pubescent, erect legumes. 108. HOSACKIA PURSHIANA, Benth. 109. LATHYRUS ORNATUS, Nutt., and a pubescent variety. 110. L. LINEARIS, Nutt. 111. L. POLYMORPHUS, Nutt. 112. L. PALUSTRIS, var. *myrtifolius?* a small portion, and mainly VICIA AMERICANA, Muhl. 113. ASTRAGALUS RACEMOSUS, Pursh. 114. A. (PHACA, Hook.) BISULCATUS, Gray; in fruit. 130. Same in flower. 115. A. (PHACA, Hook.) NIGRESCENS, Gray. 116. A. (PHACA, Hook.) GLABRIUSCULUS, var. *major*, foliolis anguste oblongis. Very likely, as Hooker conjectured, a form of *A. aboriginum*. A narrow, membranous, rudimentary false septum is borne on the dorsal suture, in the manner of *A. Robbinsii* and *A. alpinus*, to which, indeed, the species is related. It was collected in the mountains, "at middle elevation: not common." 117. A. OROBOIDES, Hornem. (*Phaca elegans*, Hook.) "Along the bank of streams, at middle elevations, and subalpine." Very fine specimens, both in flower and in fruit; the former with linear leaflets, like the original *P. elegans*; the latter with broader and glabrate leaflets, just like Bourgeau's specimens from the Saskatchawan. 118. A. FLEXUOSUS, Dougl. (*Phaca flexuosa* and *P. elongata*, Hook.) Legumes straight or slightly curved. "Low mountains and plains; common." 119. A. GRACILIS, Nutt. With the last. 121. A. near *Phaca debilis*. Nutt., but larger in all its parts. To be determined hereafter in a general revision of the species.* 122. A. MOLLISSIMUS, Torr., of which the stipules were wrongly described. a form with silvery instead of yellowish pubescence. Fine specimens, same as Parry's 184, doubtfully compared with *A. glareosus*, still without fruit. "On the plains; scarce." 123. A. PARRYI, Gray: now collected with ripe legumes, which are so obcompressed and sulcate both sides that the sutures meet. "Common both on the low mountains and subalpine." 124. A. DRUMMONDII, Hook. 125. A. ALPINUS, L. "From middle elevations to truly alpine." 126. A. CYANEUS, Gray, Pl. Fendl. Specimens more luxuriant than Fendler's; the leaflets oval, half to two-thirds of an inch long, and young pods nearly two inches long. This is likely to be *A. Shortianus*, Nutt., of which I have seen no specimens; but the flowers are deep blue. "Low mountains, and rarely subalpine; a fine species." 127. A. MISSOURIENSIS, Nutt. 128. A. SPARSIFLORUS, n. sp., to be elsewhere characterized in a revision of the North American species. "On low mountains: rare." 129. Perhaps a variety of the last, with more numerous flowers and larger legumes. 141. A. (PHACA) PAUCIFLORUS, Hook.? A glabrate, slender form, the same as *Phaca pauciflora*, Nutt. "South Park, common, apparently a good forage plant." (Fendler's, No. 144 is the same.) 130. A. (PHACA) BISULCATUS, Gray, in flower. 131. A. (PHACA) LOTIFLORUS, Hook., very fine specimens in flower and fruit. 132. (fruit) & 133. (fl.) A. CARYOCARPUS, Ker. 134. A. (PHACA, Hook.,) PECTINATUS, Gray. 136. A. STRIATUS, Nutt.! 137. A. (PHACA, L.) FRIGIDUS, with perfectly glabrous legumes, as in other American specimens. "Subalpine, in wet pine-woods." 138. A. (PHACA) FILIFOLIUS, Gray, in Pacif. R. R. Exped. *Phaca longifolia*, Nutt. 139. A. HYPOGLOTTIS, L. 145. A. (OROPHACA) SERICOLEUCUS, Gray *Phaca sericea*, Nutt.); charming specimens of an interesting plant. 142. HOMALOBUS DECUMBENS, Nutt. Also 435 of Parry, very sparingly collected. Its name as an *Astragalus* can be settled only upon a revision of the species. 120. (and 433 of Parry,) OXYTROPIS DEFLEXA, DC. 135. O. SPLENDENS, Dougl.: worthy of the name. 140. O. LAMBERTI, Pursh, with purple or blue, and with white

* The name *Astragalus debilis* could properly be retained for *Phaca debilis* of Nuttall. For there is no *A. debilis* of Douglas: that so given in Walp. Repert. I. p. 710. being an accidental error for *A. miser*, Dougl.

flowers: "very ornamental and very variable." 143. O. ARCTICA, R. Br. "High alpine." 144. O. MULTICEPS, Nutt. in Torr. and Gray, Fl. (*Physocalyx multiceps*, Nutt. in herb. Acad.) "Subalpine and lower." This is Dr. Parry's No. 191, which I wrongly referred to *O. nana*, Nutt. The plant is more dwarf and the leaflets much smaller than in Nuttall's specimens, which are in fruit only, while ours, last year in blossom only, now show the young fruit in the bladdery calyx. It is a very pretty plant. 146. SOPHORA SERICEA, Pursh. 147. GLYCYRRHIZA LEPIDOTA, Nutt.

ROSACEÆ.

148. PRUNUS (CERASUS) PENNSYLVANICA, L. 149. SPIRÆA DUMOSA, Nutt. 150. S. OPULIFOLIA, L., var. *parvifolia*. 151. SIBBALDIA PROCUMBENS, L. 152. GEUM (SIEVERSIA) TRIFLORUM, Pursh. 156. G. (SIEVERSIA) ROSSII, Ser. 153. DRYAS OCTOPETALA, L. 154. POTENTILLA FISSA, Nutt. 155. P. FRUTICOSA, L. 157. P. CONCINNA? R. Br. 158. P. PENNSYLVANICA, L., var. *Hippiana*, Torr. and Gray. 159. P. PASTIGIATA, Nutt. ? which specimens of Parry's, in 1861, (with 217) ally to large states of *P. nivea*. (A glabrate specimen intermixed, is the same as Parry's 218, *P. Drummondii*, &c., Lehm.) 160. P. NIVEA, L., a form with the leaflets more deeply incised than in 215 of Parry. 161. P. PLATTENSIS, Nutt. ? the leaves more dissected, so as to be almost bipinnately parted; the same as a plant of Bourgeau's collection, from the Saskatchawan. "Common in wet ground; spreading." 162. P. PENNSYLVANICA, L., var. *strigosa*, Pursh, with some of the coarser No. 158, perhaps accidentally mixed. 163. RUBUS DELICIOSUS, James; the same as Parry's 210, with large white petals. This will be very ornamental in cultivation. 164. RUBUS TRIFLORUS, Richards., in fruit. 165. CERCOCARPUS PARVIFOLIUS, Nutt.* 462. CHAMÆRHODOS ERECTA, Bunge.

ONAGRACEÆ.

166. EPILOBIUM PALUSTRE, L. 167. E. ALPINUM, L. 168. E. PANICULATUM, Nutt. 169. E. LATIFOLIUM, L. 170. E. ANGUSTIFOLIUM, L. 171. GAYOPHYTUM RACEMOSUM, Torr. and Gray, with a specimen of 168 intermixed in my set. 172. G. RAMOSISSIMUM, Torr. and Gray; the var. *deflexum*, Hook., in Lond. Jour. Bot., 6, p. 224, where the names of the two varieties are transposed. 173. ŒNOTHERA MARGINATA, Nutt. 174. Œ. MISSOURIENSIS, Sims. 175. Œ. TRILOBA, Nutt. 176. Œ. NUTTALII, Torr. and Gray, (*Taraxia longiflora* and *brevifl ra*, Nutt., the specimens belonging to the latter form), South Park. 177. Œ. PINNATIFIDA, Nutt. (see Parry, Enum., p. 40 (333), the hirsute specimen, which is just Parry's 116, and a canescently puberulent specimen, which, from its obcordate petals, should also be of this species, but not in fruit. 178. Œ. CORONOPIFOLIA, Torr. and Gray, exactly No. 222 of Fendler's collection. 179. Œ. SERRULATA, Nutt. 180 (and 436 of Parry). GAURA PARVIFLORA, Dougl. 181. GAURA COCCINEA, Nutt. 182. HIPPURIS VULGARIS, L.

LOASACEÆ.

569. MENTZELIA (BARTONIA) NUDA, Torr. & Gray. 570. M. (BARTONIA) MULTIFLORA, Nutt.: the form with cylindrical capsules. 571. M. ALBICAULIS, Dougl., (Parry's 126,) and some M. OLIGOSPERMA, Nutt.

CACTACEÆ.

183. OPUNTIA MISSOURIENSIS, DC., with a red flower also in my set, probably of O. RUTILA, Nutt.

GROSSULARIACEÆ.

184. R. LACUSTRE, Poir, var. (*R. setosum*, Dougl.) 185. R. LEPTANTHUM, Gray, Pl. Fendl. 186. R. CEREUM, Dougl. 187. R. HIRTELLUM, Michx. 188. R. AUREUM, Pursh.

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* PURSHIA TRIDENTATA, DC. is No. 452 of Dr. Parry's Saratoga collection, from Middle Park.

CRASSULACEÆ.

189. SEDUM RHODANTHUM, Gray, Enum. Pl. Parry. In fruit; the inflorescence a dense spike-like thyrsus, oblong. 190. S. STENOPETALUM, Pursh. 191. S. RHODIOLA, L. (192. See Borraginaceæ.)

SAXIFRAGACEÆ.

193. SAXIFRAGA NIVALIS, var.? An undeveloped specimen of this, in Parry's collection of 1851, was referred to *S. hieracifolia?* But the well-developed specimens appear to pass into the large state of the next. The limits between *S. nivalis, Virginiensis* and *integrifolia* are not obvious. 194. S. NIVALIS, L., one form the same as Parry's 169; the other has a scape nine inches high, bearing several peduncled erect flower-clusters in a racemose manner, just as in 193, from which it differs in its shorter and smaller, more-toothed leaves. 195. S. CERNUA, L. 196. S. CONTROVERSA, Sternb., referred by several authors to *S. adscendens*, L. Alpine region; before found in America only by Bourgeau, in the Rocky Mountains further north; known in Northern Asia. 197. S. BRONCHIALIS, L. 198. S. DEBILIS, Engelm. n. sp.* "Alpine." 199. S. SERPYLLIFOLIA, Pursh; but probably only a high alpine, very dwarf and tufted variety of *S. Hirculus*, L., this being the view taken of it in the Enumeration of Parry's collection of 1861, No. 164. The characters hold out in the present collection. 201. S. HIRCULUS, L., in the ordinary form, as different from 199 as possible. "South Park, in wet or swampy places." 200. S. FLAGELLARIS, Willd. (202. See under Primulaceæ.) 203. S. JAMESII, Torr., from the original stations. A most rare and peculiar species. 207. S. PUNCTATA, L. (*S. æstivalis*, Fisch.) 204. HEUCHERA PARVIFOLIA, Nutt., the large form,—viz.: Parry's 174,—with some specimens passing to Parry's 173, the small form. 205. HEUCHERA BRACTEATA,† Seringe (*Tiarella? bracteata*, Torr.,) the same as Parry's 172, mixed with a large-flowered, apparently new species, H. HALLII.‡ Rocks, on mountains of medium elevation. 206. LITHOPHRAGMA PARVIFOLIA, Nutt. 208. MITELLA PENTANDRA, Hook.; in fruit. 576. CHRYSOSPLENIUM ALTERNIFOLIUM, L. 568. JAMESIA AMERICANA, Torr. & Gray. (209. See Euphorbiaceæ.)

UMBELLIFERÆ.

210. CYMOPTERUS GLOMERATUS, DC. A plant rarely collected, but said to be very common on the plains, along with the next. 211. C. MONTANUS, Nutt. 213. C. ALPINUS, Gray, Enum. Pl. Parry, p. 19 (408,) No. 158; with good fruit as well as flowers. 212. PEUCEDANUM NUDICAULE, Nutt.? at least the plant so named in Hayden's collection on the *Mauvaises Terres* of Nebraska; but the plant is minutely pruinose-pubescent, not glabrous, nor is the fruit truly that of a *Peucedanum*, the marginal wings being double, nor from the description can it be the original *Smyrnium nudicaule* of Pursh. It must re-

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* This was mixed with No. 167 (S. CERNUA, L.) of Dr. Parry's collection in 1861, but very sparingly distributed. It has a granulate root, so called, and the foliage much as in *S. Sibirica*, but is perfectly glabrous throughout, and with the adnate tube of the calyx wholly adnate to the ovary. As it is manifestly related to *S. rivularis* though quite distinct, I suppose it may be the "*S. Cymbalaria*, vel. n. sp.," or the species compared with *Sibirica*, of Chamisso in Linnæa, 6, p. 555, which in the Flora Rossica are doubtfully referred to *S. rivularis*. In which case I know of no name to take precedence of this proposed by Dr. Engelmann.

† HEUCHERA BRACTEATA (Seringe): glabella, minutissime pruinoso-glandulosa; thyrso denso subracemiformi multifloro; bracteis saepe flores flavido-virescentes subæquantibus; calyce oblongo fere ad medium 5-fido, lobis spathulato-oblongis; petalis attenuatis acutis filamentis vix latioribus; staminibus stylisque demum exsertis. Scape from a span to nearly a foot in height, often foliose-bracteate. Thyrsus commonly more or less secund. Flowers barely two lines in length. Teeth of the leaves usually setaceously mucronate.

‡ HEUCHERA HALLII (sp. nov.): hirsutula; thyrso racemiformi sublaxo 16–30-floro; bracteis pedicellos vix superantibus; floribus albidis (nunc roseo tinctis?); calyce lato-campanulato 5-lobo, lobis lato-ovatis; petalis spathulatis obtusis exsertis; staminibus stylisque inclusis. Scapes usually a span high. Flowers about three lines long, but the calyx twice the breadth of that of *H. bracteata*, and very different in shape. Pedicels, when fully developed, sometimes nearly as long as the flower. Leaves as in the preceding species, considerably variable.

main uncertain until the order is revised. A solitary fruiting specimen in Dr. Parry's collection of 1861 was very carelessly named *Leptotænia dissecta*, which is quite a different plant. 214. MUSENIUM TRACHYSPERMUM, Nutt.; near *M. divaricatum*, but the young fruit much shorter as well as more scabrous. 215. THASPIUM TRACHYPLEURUM, n. sp.,* in fruit, the same as 159 of Parry in 1861, of which the fruit was too young. It proves to be quite different from that of *T.? montanum*, var. *tenuifolium*. The genus is uncertain; but it can hardly be well separated from *Thaspium*. 217. T. MONTANUM, Gray, Pl. Fendl., in flower and in fruit, the latter with the three dorsal wings sometimes barely salient, sometimes as much developed as the marginal ones. 216. CONIOSELINUM FISCHERI, Wimm.; "alpine and subalpine." 218. C. CANADENSE. Torr. and Gray, probably a larger and coarser form of 216: "on low mountains." 219. ARCHANGELICA GMELINI, DC. 220. ARCHEMORA FENDLERI, Gray, Pl. Fendl.; fine, large specimens with good fruit, "in subalpine woods." It is 155 of Parry's 1861 collection, which I carelessly named *Berula angustifolia*. 221. An acaulescent Umbellifer, undeterminable for the want of fruit. 222. CYMOPTERUS? ANISATUS, n. sp., called "*C. terebinthinus*, var. *fœniculaceus*" in Parry's 1861 collection (No. 157); but it can hardly be either of Nuttall's species under those names, on account of the very long and subulate leaflets of the involucel as well as calyx-teeth, yet apparently related to them: the foliage, &c., very similar. Mature fruit not collected; some of the present collection pretty well formed has the wings abortive, while in younger fruits of 1861 these are obvious and somewhat undulate. This dubious plant inhabits "dry hills in the middle mountains, and is a very aromatic herb." The foliage of the dried specimens and the fruit have a pleasant anisate flavor,—characters unknown in the polymorphous genus *Cymopterus*, and rendering the genus of this plant yet more doubtful.

ARALIACEÆ.

223. ADOXA MOSCHATELLINA, L. "Subalpine; common."

CORNACEÆ.

CORNUS CANADENSIS, L. In the mountains Dr. Parry gathered one or two specimens of the ordinary form of this species; and in the alpine region also a depauperate form of it, some specimens of which, having a pair of leaves lower down on the stem, and those from the upper axils small, might readily be mistaken for *C. Suecica*. They are distributed as No. 437 of Parry.

CAPRIFOLIACEÆ.

224. LINNÆA BOREALIS, Gronov. 225. SYMPHORICARPUS MONTANUS, HBK. 227. S. OCCIDENTALIS, R. Br. 226. LONICERA INVOLUCRATA, Banks. 228. VIBURNUM PAUCIFLORUM, Pylaie.

RUBIACEÆ.

229. GALIUM BOREALE, L. 230. G. TRIFIDUM, L., the reduced, northern form, near *G. palustre*.

VALERIANACEÆ.

231. VALERIANA DIOICA, L., var. *V. sylvatica*, Richards.

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* THASPIUM TRACHYPLEURUM sp. nov.: glabrum: caule (pedali) striato 1–3-foliato umbellas 2–3 longius ac pedunculatas gerente: foliis ternato-decompositis, segmentis filiformibus mucronulatis, petiolis basi dilatatis haud scarioso-marginatis: involucro et involucello foliolis 1–2 subulatis parvis: floribus flavis: fructu dilyno ovato lateraliter compresso, mericarpiis sectione transversali fere orbiculatis, jugis alisve 5 conformibus crassis subæqualibus latissimis a commissurali a carpophoro demum liberæ, valleculis omnibus grosse univittatis. On the mountains, at middle and lower elevations. Leaves more decompound than in the *T. montanum* var. *tenuifolium*, with which I had confounded it, the segments shorter and more rigid: the fruit shorter, 1½ to 2 lines long, the mericarps not at all flattened dorsally, in shape and scent like those of *Thaspium*, and the short wings remarkably thick and corky, scabrous-roughened. A similar corky ridge at the commissure in the section simulates another wing or rib, except that it is partly divided by a groove, which receives the carpophore.

COMPOSITÆ.

222. ERIGERON ACRE, L. 233. DIPLOPAPPUS ERICOIDES, Torr. and Gray. 234. ERIGERON COMPOSITUM, Pursh. 235. E., a species wholly doubtful to me, with deep purple or blue rays,—except in this respect the same as the white-rayed specimens of Parry's No. 3, which I had confounded with those of *E. uniflorum*, with which it was mixed. I dare not now venture to describe it as a new species. 236. E. GLABELLUM, var. *pubescens*, Hook. Bourgeau collected the same form in the Rocky Mountains. 237. E. DIVERGENS, Torr. and Gr. 238. E. GRANDIFLORUM, Hook., var. *elatius*, Gray, Enum. Pl. Parry, No. 1: a still more luxuriant plant; stems more than a foot high, leafy to the summit, bearing two to four heads, with the same very woolly involucre. 243. E. UNIFLORUM, L., both the same as Parry's No. 8, and large and tall forms 6 to 9 inches high, with light-colored long wool to the involucre, as in the foregoing. "Common in the high alpine region." 239. E. GLABELLUM, Nutt.? var. *molle*. This is recorded as a common species at all heights. But I have never before seen such a form, except one of Bourgeau's, the largest specimens distributed under "*E. canescens*," and that has white rays. From the shape of the leaves, and their size and abundance up to the summit of the stem, this should rather be referred to *E. macranthum*: but the pubescence is strange for that species. 240. E. GLABELLUM, Nutt. Parry's No. 4 (collected again) is a dwarfer form of the same, and belongs rather to *glabellum* than to *E. macranthum*. (241, 242. See below, under Aster. 243. See above.) 244. E. CÆSPITOSUM, Nutt.; a strict form, near the var. *grandiflorum*,—of which *E. conum*, Gray, Pl. Fendl., is evidently a form. "Common on low mountains." 245. E. PUMILUM, Nutt. 246. E. BELLIDIASTRUM, Nutt.

247. SOLIDAGO LANCEOLATA, L. 248. S. NEMORALIS, L.; a dwarf, subalpine form, passing to *S. nana*, Nutt. 249. S. MISSOURIENSIS, Nutt.; a dwarf form. 250. S. VIRGA-AUREA, L.; two forms. 251. S. VIRGA-AUREA, var. *multiradiata*, Torr. and Gray. Dr. Parry collected one specimen of *S. humilis* on Clear Creek.

241. ASTER SALSUGINOSUS, Richards. "Subalpine." This is also 403 of Dr. Parry's separate collection. 242. A. GLACIALIS, Nutt. "In the high alpine region." 252. A. ABSCISUS, Lindl., var. *ciliatifolius*, Torr. and Gray, (which is also 419 of Parry,*) and the var. *Fremontii*, Torr. & Gray, Fl. Suppl. 253. Various forms of the last. "alpine and subalpine, in low grounds," the larger ones (same as Parry's 417) passing towards *A. integrifolius*, Nutt., but the involucre not manifestly glandular. All the peculiar Asters of the Rocky Mountains and westward require complete re-elaboration. 254. (also 418 of Parry.) A., near the smooth form of ERICOIDES, L., and probably a variety of it, but with laxer and narrower scales to the involucre. The rays are pinkish, as they sometimes are in the eastern plant. "In the mountains, at middle elevations."

255. APLOPAPPUS INULOIDES, Torr. and Gray. Subalpine, in the South Park. 256. A. (STENOTUS) PYGMÆUS, Gray, Enum., Pl. Parry, mixed with specimens of an equally dwarf new species, which Dr. Lyall collected, in 1850, on the summits of the eastern side of the Cascade Mountains, at 7500 hundred feet above the sea. It should therefore be named A. LYALLII.† Both high alpine.

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* ASTER ABSCISUS, Torr. and Gray, not in the general collection, is again, in Parry's separate collection, No. 418, in the finest state.

A. FREMONTII, Gray, Pl. Fendl., perhaps a hispid form of *A. Nuttallii*, was sparingly collected on sand hills, on the plains, but not distinguished.

† APLOPAPPUS LYALLII (sp. nov.): annuus, undique pruinoso-glandulosus: caulibus 2–4-pollicaribus [illegible]: foliis integerrimis subtus [illegible] squamis interioribus [illegible] squamis subæqualibus lanceolato-subulatis glandulo-scabris, [illegible] floribus fertilibus [illegible] disci æqualibus. Formæ [illegible] LYALLII: [illegible] squamis minus [illegible]

257. A. (PYRROCOMA) CROCEUS, n. sp.* Subalpine, in the Middle Park, &c., west of the Rocky Mountain range. 258. A. (PYRROCOMA) FREMONTII. *Pyrrocoma foliosa*, Gray in Jour. Bost. Nat. Hist. Soc., 5, 1843. Low mountains, lat. 39°. There is a Chilian *A. foliosus*; wherefore, in suppressing *Pyrrocoma* as a genus, the name of this most rare and well-marked species may very properly commemorate the discoverer. 259. A. (PYRROCOMA) PARRYI, Gray, Enum. Pl. Parry. 260. CHRYSOPSIS VILLOSA, Nutt., with the dwarf variety, *C. hispida*.

261. IVA AXILLARIS, Pursh; a broad-leaved form. 262. I. CILIATA. Willd. 263. EUPHROSYNE (CYCLACHÆNA) XANTHIIFOLIA, Gray. 264. FRANSERIA TOMENTOSA, Gray, Pl. Fendl. 265. F. HOOKERIANA, Nutt.

266. LEPACHYS COLUMNARIS, Torr. & Gr. 267. GAILLARDIA ARISTATA, Pursh. 268. HELIANTHELLA UNIFLORA, Torr. and Gr. Fine specimens. The achenia are ciliate with very long hairs; the awns are long, slender and persistent.† 269. HELIANTHUS PUMILUS, Nutt.? Parry's No. 50. 270. H. PETIOLARIS, Nutt. 271. (& 420 of Parry.) HELIOMERIS MULTIFLORA, Nutt.; the broader leaved form. 272. HELENIUM HOOPESII, n. sp., a most striking species, seeds of which were collected near Pike's Peak in the autumn of 1859, by Mr. Thomas Hoopes, from which plants were raised by Mr. Halliday Jackson, of Westchester, Pa.‡ 273. ACTINELLA GRANDIFLORA, Torr. and Gr.; equally fine specimens as those of last year. 274. ACTINELLA RICHARDSONII, Torr. and Gr. 275. A. SCAPOSA, Nutt. var. (*A. glabra*, Nutt.) 276, 277. A. ACAULIS, Nutt., in different forms. 278. BAHIA OPPOSITIFOLIA, Torr. and Gr. 279. THELESPERMA (COSMIDIUM) GRACILE, Gray. 280. T. FILIFOLIUM, Gray. 281. VILLANOVA CHRYSANTHEMOIDES, Gray. 282. HYMENOPAPPUS TENUIFOLIUS, Pursh. 283. CHÆNACTIS ACHILLÆFOLIA, Hook. Arn.; a low form from the alpine region. 284. C. ACHILLÆFOLIA, var.

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exterioribus paullo brevioribus: foliis parvulis, caulinis superioribus gradatim minoribus 6–3 lin. longis acutioribus. 3. HALLII: involucri squamis plerisque latioribus, extimis oblongo-linearibus dorso a basi æquantibus: foliis etiam caulinis magis spathulatis, summis parvis capitulum æquantibus, radicalibus bipollicaribus. Head half an inch long and wide. Ligules exserted 3 or 4 lines long. Appendages of the style in the disk-flowers oblong-lanceolate. Ovaries in Hall and Harbour's plant sparsely beset with a few slender hairs: in Dr. Lyall's glabrous.

* APLOPAPPUS (PYRROCOMA) CROCEUS sp. nov.: caule ultrapedali parce foliato monocephalo primum lanato: foliis coriaceis glabris integerrimis haud eximie reticulatis, radicalibus oblongo-lanceolatis in petiolo pedalibus, caulinis lanceolatis oblongisve basi semiamplexicaulibus; capitulo maximo: involucri hemisphærici squamis ovalibus obtusissimis margine interioribus **margine subscarioso-erosis; ligulis 50 et ultra longe exsertis supra croceis; ovariis brevibusculis** glaberrimis, pappo elliptico-oblongum disci æquante. Allied to *Pyrrocoma* Hook., Nutt., which, however, is plainly distinct from *Aplopappus Pyrrocoma*, Hook., Gray. But the leaves are less coriaceous and reticulated: **the head naked, peduncled, and I believe nodding; involucre** an inch in diameter: the long exserted rays nearly an inch in length; **the ovaries far shorter, and the pappus white.** But I have this only in flower, and *P. radicata* in fruit.

† The former, apparently quite distinct, new species of this genus, was sparingly collected by Dr. Parry in Middle Park, near the foot of Pike's Peak. I have also received a specimen from Mr. Hall. It is distinguished by its small leaves and heads, thin and scarious chaff, and the awnless achenia crowned with hyaline squamellæ, which are resolved into a villous fringe that equals the **proper tube** of the corolla in length.

HELIANTHELLA PARRYI sp. nov.: pedalis, hirsuta; foliis triplinerviis lanceolatis vel radicalibus spathulatis, caulinis superioribus sublinearibus 1-2-pollicaribus: capitulis 2–3 parvis brevissime pedunculatis; receptaculi paleis tenuissimis scariosis apice rotundato lacerulatis: ovariis marginalibus exterioribus sterilibus, interioribus superne parce villosis ciliatis exsistatis: pappi paleis 2 oppositis. 4 latis tenuissime laceris in villum tubum proprium corollæ elegantem connatis. Involucre only half an inch long: disk half an inch in breadth: rays 7 to 9 lines long.

† HELIANTHUS HOOPESII sp. nov.†: caule validiusculo tomentuloso sesquipedali ligulato monocephalo: foliis glaucescentibus pellucido-punctatis mox glabratis subnervatis integerrimis radicalibus lanceolatis in petiolum longum alatum angustatis, caulinis oblongo-lanceolatis sessilibus et amplexicaulibus; pedunculis striatis in racemum brevem simplicem dispositis: **capitulis pro genere maximis; involucri squamis lanceolatis** subherbaceis: receptaculo subglabro: ligulis 20–25 linearibus patentibus pollicaribus: pappi paleis lanceolato-subulatis exterioribus corolla disci paullo brevioribus achenium sericeo-villosum æquantibus. **"South Park and west of Pike's Peak."** Radical leaves 6 to 11 inches long, tapering into a petiole-like base or flat and winged petiole: the cauline ones successively shorter and more dilated at the base, the uppermost 1½ to 2 inches long: disk in the wild specimens an inch in diameter, and the numerous orange-yellow rays an inch long. Paleæ with the pappus tapering to a sharp point, but not awned. This species is one of those which go to fill the interval between *Helenium* and *Helianthus*, but is clearly of the former genus.

Douglasii, (*C. Douglasii*, Hook. and Arn.) 352. PALAFOXIA HOOKERIANA, Torr. and Gray, with smaller heads.

285. MACHÆRANTHERA TANACETIFOLIA, Nees, (*Dieteria coronopifolia*, Nutt.) 286. GRINDELIA SQUARROSA, Dunal, with larger and with smaller heads. 287. (and 425 of Parry,) APLOPAPPUS RUBIGINOSUS, Torr. and Gr. 288. A. SPINULOSUS, DC. 289. TOWNSENDIA GRANDIFLORA, Nutt. 290. T. SERICEA, Hook.

291. ASTER (OXYTRIPOLIUM) ANGUSTUS, Torr. and Gr. (*Tripolium angustum* and *T. frondosum*, Nutt.) 292. LINOSYRIS (CHRYSOTHAMNUS) GRAVEOLENS, Torr. and Gr.; the form with small heads, and acute and viscid scales of the involucre. It occurs, much better developed, in Parry's separate collection, No. 415.* 293 (and 413 of Parry,) L. (CHRYSOTHAMNUS) PARRYI, n. sp.† A very distinct species, which is said to abound in the Middle Park, South Park, and all that district; the wonder is that it has not been detected before. The spiciform or racemose and leafy inflorescence, and the large heads with lax and taper-pointed scales, are characteristic. 295. L. (CHRYSOTHAMNUS) VISCIDIFLORA, Torr. and Gr.; the variety with broadish and hispidulous-ciliate leaves (*L. serrulata*, Torr.); again collected also by Dr. Parry, under his number 49. 294 (and 426 of Parry,) GUTTIEREZIA EUTHAMIÆ, Torr. & Gr. 296. MACRONEMA DISCOIDEA, Nutt. "Blue River, west of the Rocky Mountain range." An interesting rediscovery of a very rare plant.

297. PECTIS (PECTIDOPSIS, DC.) ANGUSTIFOLIA, Torr. Gravelly banks of streams.

298. ARTEMISIA ARCTICA, Less. (*A. Norvegica*, Fries); a more hairy form, —the same as Parry's 42, which I wrongly considered as a variety of *A. Richardsoniana*. "Strictly alpine." 299. A. SCOPULORUM, n. sp.,‡ a "strictly alpine" species, allied to *A. lanata*, and to be compared with *A. heterophylla*, Bess., which, however, is placed in the section *Abrotanum*, while this plant has the woolly hairs of the receptacle as long as the flowers themselves, in which respect it also differs from the very similar *A. Richardsoniana*. 300. A. CANADENSIS, Michx. 301. A glabrous form of the last, with small heads, too near *A. caudata* and some forms of the next. 302. A. DRACUNCULOIDES, Pursh, var. *brevifolia*, and specimens with trifid leaves passing into 301. 303, 305, (also 411 and 412 of Parry). A. LUDOVICIANA, a form with small leaves, and also the var. *gnaphalioides*. 304. A. FRIGIDA, Willd. 306. A. TRIDENTATA, Nutt.§ "On the Blue River, west of the Rocky Mountain range." 307. A. FILIFOLIA, Torr. (308. See Chenopodiaceæ.)

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* No. 414 of Parry's separate collection is a glabrate form of the same common species, of which only traces of the close and white down remain, and the leaves and heads are larger.

† LINOSYRIS (CHRYSOTHAMNUS) PARRYI (sp. nov.): fruticosa; ramis virgatis lanoso-dealbatis; foliis linearibus fere glabris subviscosis, floralibus conformibus capitula in thyrsum angustum congesta longe superantibus; involucro 10–15-floro cylindraceo pauciseriali, squamis sublaxe imbricatis albidis lanceolatis, omnibus exterioribus sæpius folioso-interioribus scarioso-attenuato-acuminatis; corollæ tubo hirsutulo; achæniis linearibus cano-pubescentibus. Leaves 2 to 3 inches long, 3-nerved, acute, plane, the larger ones 2 lines wide and tapering to the base. Thyrsus narrow, often almost simply racemose or spiciform, sometimes more compound and branchy. Heads about two-thirds of an inch long, foliose-bracteate; the bracts passing into the exterior and leafy-tipped scales of the involucre. Receptacle, styles, viscidity, aroma, &c., as in *Chrysothamnus* generally.

‡ Also No. 41 of Dr. Parry's separate collection of 1862 (not of 1861, which is *A. borealis*, a very different species.)

ARTEMISIA (ABSINTHIUM) SCOPULORUM (sp. nov.): cæspitosa: rhizomate repente: caulibus simplicissimis spithameis: foliis albido-sericeis plerisque pinnati-3–5-sectis, segmentis præsertim radicalium tripartitis, lobis cum foliis summis linearibus angustis; capitulis pluribus vel paucis simpliciter racemosis spicatis breviter pedicellatis erectis (lin. 2–3 latis), involucro hemisphærico, squamis ovalibus extus dorso villosis margine lato scarioso atro-fusco cinctis; lana receptaculi copiosa corollas superne longe pilosas adæquante. Var. MONOCEPHALA; caule 2–3-pollicari capitulo solitario unoquoque terminato; foliis etiam radicalibus simpliciter tripartitis vel partim 5-partitis partim integris linearibus. Stems scarcely pubescent, sometimes glabrate below. Floral leaves or bracts filiform, linear, entire, the lower surpassing the head. Pedicels a line or a line and a half long, strictly erect. Flowers 30 or more, tipped with purplish.

§ This is 410 of Parry's separate collection, from Middle Park; and his 409, associated with the above, is A. CANA, Pursh; these two being the *Wild Sage* of Lewis and Clarke.

309. ANTENNARIA CARPATHICA, var. *pulcherrima*, Hook. A remarkable and leafy-stemmed form.* 310. A. DIOICA, Gærtn., and A. ALPINA (female, 1–3-cephalous), mixed. Good specimens of *A. alpina* were separately collected on Mount Flora by Dr. Parry, No. 422. 311. GNAPHALIUM STRICTUM, Gray in Bot. Whippl., Exped. Pacif. R. R. Surv. 4, p. (54) 110; a less strict and many-stemmed form. "Wet places in the mountains." 312. G. DECURRENS, Ives. "Subalpine; rare."

313 (and 423 of Parry). BRICKELLIA GRANDIFLORA, Nutt., var. *minor*: foliis profundius cordatis capitulisque minoribus; involucri squamis acutioribus. 314. NARDOSMIA SAGITTATA, Hook., var. with very obtuse leaves, connecting with *N. frigida*. "Near Pike's Peak." 315. LIATRIS PUNCTATA, Hook.

316. SENECIO LUGENS, Richards., a typical form, and others belonging to *S. fastigiatus* and *S. exaltatus*, Nutt., but dwarf. "A common and variable species, at all heights and in all situations, flowering from June to September." 326. A dwarf form of the same, nearly Parry's 21, and just Fendler's 477. 325. S. LUGENS, the downy state, same as Parry's 23, one of the forms of *S. exaltatus*, Nutt. 317. S. AMPLECTENS, Gray, Enum. Pl. Parry, p. 11, No. 56, a species which, considering the various forms under which it now occurs, was not very well named. A new specific character is appended.† It is a sub-alpine and alpine species.

318. S. INTEGERRIMUS, Nutt. A low form; "alpine." 319. S. SOLDANELLA, n. sp.‡ "High alpine, among rocks; heads generally single." They are solitary in all the specimens I have seen.§ 320. S. CERNUUS, Gray, Enum. Pl. Parry, No. 52. "A common species at middle and subalpine elevations." 321. S. BIGELOWII, var. *Hallii*.‖ "Subalpine; heads very drooping, rayless." 322. S. FREMONTII, Torr. and Gr. "Alpine;" a well-marked species. Recently collected by Dr. Lyall on the summit of the Rocky Mountains, in lat. 49°.¶ 323. S. TRIANGULARIS, Hook., with shorter and finer teeth to the leaves, the

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* ANTENNARIA MARGARITACEA, R. Br., var. *subalpina*: caule spithamæo ad subpedalem simplicissimo, corymbo congesto fere capitato. A singular, nearly alpine form, collected only by Dr. Parry, No. 421.

† SENECIO AMPLECTENS (Gray, l. c.): lana floccosa mox decidua glabratus; caule semi-sesquipedali e radice perenni apice nudo 1–3-cephalo; foliis membranaceis oblongis lingulatisve aut repando aut argutissime dentatis nunc sublaciniatis, imis basi angustatis vel in petiolum alatum attenuatis, superioribus sessilibus basi (nunc lata) semi-amplexicaulibus; capitulis in pedunculo gracili nutantibus; involucro calyculato laxo; ligulis linearibus elongatis (1–2-pollicaribus) aureis; acheniis glaberrimis.

Var. TARAXACOIDES (*S. Fremontii*, var.? Gray, Pl. Parry, p. 9, No. 28): vere alpinus, 4–5-pollicaris, monocephalus; capitulo minori minus nutante (ligulis semi-subpollicaribus,); foliis omnibus basi attenuatis pl. m. laciniatis. In the high and bare alpine region. This, judging from intermediate forms in Hall and Harbour's collection, must be regarded as a depauperate, alpine variety of *S. amplectens*. Dr. Parry gathered only two or three specimens, like those of the former year.

‡ SENECIO SOLDANELLA (sp. nov.): subcaulescens, nanus, glaberrimus, subglaucus, fere semper monocephalus: radice fasciculato-fibrosa: foliis crassis subtus purpureo tinctis, radicalibus imisque orbiculatis nunc subreniformibus nunc basi trinervata in petiolum longum seu longissimum planum contractis sæpius denticulatis (circiter pollicem diametro), superioribus 1–2 minoribus oblongis spathulatisve petiolo brevi dilatato: capitulo magno (8–9 lin. longo et latum involucro e squamis lanceolatis scarioso-marginatis 16–20 cum exterioribus 7–9 angustioribus immarginatis laxioribus vel paullo vel dimidio brevioribus; ligulis oblongis 16–18 (flavis circiter 4 lin. longis) discum vix superantibus: acheniis glaberrimis. "On Gray's Peak." Dr. Parry,—who complimented the describer by naming this handsome and most distinct species, *S. Grayi*; but the *S. Greyi*, Hook., f. of New Zealand forbids this.

§ In Middle Park, Dr. Parry gathered one or two specimens of what appears to be *S. hydrophilus*, Nutt.

‖ SENECIO BIGELOWII, (Gray in Bot. Whippl. Exped. Pacif. R. R. Surv. 4, p. (55) 111), var. *Hallii*: foliis fere omnibus lanceolatis cum caule pilis articulatis pubescentibus demum glabratis), caulinis omnibus sessilibus imisve in petiolum alatum contractis. *S. megacephalus*, Nutt., thus far found only by Nuttall, has a similar pubescence, but more of it, and also on the involucre; the scales of the latter are narrower, the heads are radiate and erect, and the plant is dwarf.

¶ SENECIO FREMONTII, Torr. & Gray, Fl. 2, p. 445): totus glaber: caule simplici vel corymboso-ramoso usque ad apicem folioso (5–15-pollicari,): foliis oblongis vel obovato-spathulatis carnosulis plerisque laciniato-dentatis omnibus sessilibus, superioribus pollicaribus vel sesqui-pollicaribus, inferioribus decrescentibus, capitulis solitariis paucisve brevissime pedunculatis erectis; involucro campanulato (semipollicari) parce bracteato; ligulis 10–16 luteis; acheniis puberulis.

var. β, Torr. and Gr. Fl., verging towards the next. 324. S. ANDINUS, Nutt.? from the locality (but the heads resemble those of the last, and are of equal size), or an undescribed species, if Nuttall's *S. andinus* is Hooker's *S. serra;* intermediate between the latter and *S. triangularis.* Fremont collected a single specimen of it in his second expedition. 327. S. EREMOPHILUS, Richards. 328. S. LONGILOBUS, Benth., from the plains, with pinnately-parted leaves (Parry's No. 407): with a mountain form, having the leaves all entire and the heads narrow. The latter is the same as Parry's No. 406. The variations of *S. filifolius, longilobus, spartioides* and *Riddellii*, are now wholly inextricable. 330. S. CANUS, Hook., a form with large heads and the leaves all entire, the same as Parry's No. 20; "alpine and subalpine." 329. S. AUREUS var. *alpinus*, Gray, Enum. Pl. Parry, No. 63. This holds its character; but the heads are sometimes as many as three in a corymb. Different from *S. aureus* as it appears, it is inseparably connected with it through the var. *borealis.* ~~313.~~ 331 S. AUREUS, var. *alpinus, werneriifolius,**—very peculiar, truly alpine form, which would almost anywhere be regarded as a very distinct new species; but I think it runs into the last and into Wright's 403, &c. These forms all teach that *S. subundus*, DC., and *S. resedifolius*, Less., will also pass into *S. aureus.* Indeed, I know not where the species will stop. 332. S. AUREUS, L.? var. *crocatus.* Middle Park, &c. Both Dr. Parry (who has it as No. 405) and Mr. Hall note this as a form of the common *S. aureus* with copper-colored or saffron-colored flowers, and I cannot gainsay it, after reviewing a suite of specimens. Some of Hall and Harbour's specimens, except in the anomalous color of the flowers, very much resemble *S. aquaticus* of the Old World. One form is discoid. 333. S. AUREUS, var. *borealis* and var. *Balsamita*, Torr. and Gr.; glabrate or woolly, in various forms. "A common and very variable species, at all localities and heights, except strictly alpine. Some of the specimens are passing to *S. Fendleri*, Gray.

334. ARNICA ANGUSTIFOLIA, Vahl.; broad-leaved forms of *A. alpina*. Læst. "A variable species, from the low middle to the alpine region, flowering early and late." 335. A. MOLLIS, Hook.; "alpine and subalpine." 336. A. CORDIFOLIA, Hook., mixed with some A. LATIFOLIA, Bongard, (which Dr. Parry abundantly gathered in Berthoud's Pass; No. 408 of his collection): the latter known by the sessile cauline leaves, the narrower heads, and the almost glabrous achenia. 337. A. CHAMISSONIS, Less. South Park, &c. Passes into leafy forms of *A. angustifolia*. 338. A. ANGUSTIFOLIA? var. *radiata*, or perhaps a distinct species. This is Parry's No. 10, resembling some rough-hirsute forms of *A. angustifolia*, approaching *A. mollis*, but the cauline leaves decreasing upwards: and the rayless character holds in the numerous specimens gathered in 1862: the achenia are glabrate, although the ovaries are pubescent. It can hardly be a form of the Californian *A. discoidea*; but it needs farther comparison with that species.*

(339.) CIRSIUM ACAULE, All., var. *Americanum*. "Subalpine; common in wet

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* SENECIO AUREUS, L., var. (ALPINUS) WERNERIIFOLIUS: multiceps? cæspitosus, pilis arachnoideis: foliis radicalibus confertis spathulato-lanceolatis seu spathulato-linearibus basi attenuatis erectis coriaceis rigidis argute integerrimis marginibus saepissime revolutis ex glabretis (cum petiolo 2-4-poll. longis 2-3 lin. latis: caulinis 2-3-poll. ari bracteas paleas subulato-setaceis haud obvolutas instructo corymboso-3-5-cephalo: capitulis, etc., *S. aurei*. The leaves may be likened to those of *Hieracia* or of *Calotheca longifolium* or *alcea*.

The following ought to be thought to be a form of this, or of Wright's 403: but, besides the small leaves, the achenia are papillose-hirsute, instead of perfectly glabrous.

SENECIO THURBERI (sp. nov.): cæspitosus, cano-tomentulosus mox glabrescens: foliis pleri-que radicalibus confertis angustissime linearibus basi sensim attenuatis (cum petiolo quarter to half inch longis rigidulis integerrimis vel obsolete 2-3-dentatis marginibus quandoque revolutis: scapo spithameo 3-cephalo foliis paucis subulatis bracteisve instructo: capitulis [illegible] sed achoniis crebre papillosis hirsutis! *S. vulgaris*, var. *pauciflorus*, Gray, in Bot. Mex. Bound. p. 103. Santa Rita del Cobre, New Mexico, Prof. Thurber, Dr. J. M. Bigelow.

† TETRADYMIA CANESCENS, DC., the form with rather smaller heads and shorter leaves (*T. inermis*, Nutt.), was collected in the Middle Park by Dr. Parry, No. 416.

grounds." Stemless and polycephalous: at least my specimen has four heads nearly sessile on the crown, of equal size with those of the European plant, with which the specimens very well agree, except that the exterior scales of the involucre are all tipped with a manifest spine. Some of the leaves are barely sinuate, as in the common Siberian variety: others are nearly as deeply pinnatifid as in the European plant. 340. C. PUMILUM, Nutt.? so named in Parry's former collection: but very probably not that species. In the lack of certain original materials, and of a complete re-examination, I could not pretend to name the Thistles of the Rocky Mountains, Oregon, &c., and am not disposed to add to the existing confusion. 341. C. "a white flowered species," between the last and *C. foliosum*, (Hook.) DC., if Bourgeau's plant from the Saskatchawan is rightly named.*

343. C. DRUMMONDII, Torr. and Gr. Caulescent and leafy-stemmed, the exterior flowers having a sparingly plumose pappus: certainly very near *C. pumilum*. 342. ERIGERON CALLISTOIDES, Cass., var. *natans*, DC. "Mountains, at middle elevations, and subalpine: and in fertile, open valleys of Middle Park, where it is very common, and certainly indigenous." I have a specimen of this collected by Mr. Samuels in California, which I had thought probably an introduced plant. But it would appear to be truly American as well as Asiatic. The specimens accord with Schrank's and with De Candolle's figures of the Caucasian and Himalayan plant, although, perhaps, the appendages of the involucral scales are a little more dilated.

344. MULGEDIUM PULCHELLUM, Nutt. 345. LYGODESMIA JUNCEA, Don. 346. STEPHANOMERIA RUNCINATA, Nutt. 347. LYGODESMIA JUNCEA, var.? *rostrata*.† "On the plains; Sept.: rare." 348. CREPIS RUNCINATA, Torr. and Gr. 349. HIERACIUM TRISTE, Willd. 350. H. ALBIFLORUM, Hook. "Subalpine, west of the range: rare."‡ 351. NABALUS RACEMOSUS, Hook. "South Park; rare:" a low form. 352. See above, p. 66. 353. CREPIS OCCIDENTALIS, Nutt. The same as Parry's 70, omitted accidentally. 354. TROXIMUM GLAUCUM, Nutt., var. foliis dilatatis laciniato-pinnatifidis, segmentis lanceolat-attenuatis. Evidently a form of Parry's 65. Mr. Hall notes that it "flowers in May and the early part of June, on low mountains," and must be different from the next, which flowers two months later in the same localities. 355. MACRORHYNCHUS TROXIMOIDES, Torr. and Gr. (*Troximon aurantiacum*, Hook.): in a great variety of forms, large and small, from a foot and a half to as many inches in height, with entire, toothed, or laciniate-pinnatifid leaves; the size of the heads equally variable, and with yellow, orange, chocolate-colored or purple corollas. "Very variable at all heights, even alpine: flowers in July and August." The full suit of specimens show that to this clearly belongs *Troximon parviflorum* and *T. roseum*, Nutt., and *Macrorhynchus perpusillus*, Gray, Pl. Fendl. The fruit, when well developed, is rostrate, with a beak of about equal length with the body of the the achenium. 356. TROXIMON GLAUCUM, Nutt., var. *dasycephalum*, Torr. and Gr. (*T. taraxacifolium*, Nutt.) "High alpine, seemingly different from any of the above." It is also 424 of Parry's separate collection, from Berthoud's Pass. 357. TARAXACUM MONTANUM,

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*CIRSIUM ERIOCEPHALUM, sp. nov., will be the most appropriate name for the high-alpine Thistle which I mentioned in the enumeration of Parry's collection, 1861, p. 9, as *C. foliosum*, Hook.? It was again collected in 1862, mostly in single specimens, by Mr. Hall and Dr. Parry. It is remarkable for its dense cymes of yellow flowers being crowded into a capitate cluster, as large as a man's fist, from the summit with very spinous bracts, and clothed with long and very soft, implexed, perhaps lanate wool; the stem a foot or two in height, very leafy; the leaves linear, canescent beneath, pinnatifid, the lobes very short and few-toothed, armed with slender spines.

†LYGODESMIA JUNCEA, Don., VAR. ROSTRATA: achenii apice rostrato-attenuato; capitulis sæpe 8-floris, foliis angustissime linearibus elongatis (in hisce specim. 3–4-pollicaribus). Heads rather smaller than is usual in *L. juncea*; achenia half an inch long, the tapering apex directly contradicting the generic character "not contracted at the apex," as here they may be said to be beaked. Dr. Hayden collected the same form on the Laramie Mountains. The species all need to be defined anew.

‡To this belongs Parry's No. 71 of the 1862 collection.

Nutt., a form of *T. palustre*, DC. "In the mountains, at middle elevations, in wet ground; different from *T. Dens leonis*, which was also met with, truly indigenous." (In the high alpine region were collected a few specimens of another form,—viz.: of a very depauperate *T. laciniatum*, DC.)

CAMPANULACEÆ.

358. CAMPANULA ROTUNDIFOLIA, L., an ordinary form. 359. C. LANGSDORFFIANA, Fischer; excellent specimens of Parry's 266, exhibiting the same characters. It is said to be "very common in the subalpine region and lower, in wet ground." 360. C. UNIFLORA, L. "Pike's Peak; high alpine." 361. C. APARINOIDES, Pursh, a depauperate form.

ERICACEÆ.

362. VACCINIUM MYRTILLUS, L. "Alpine and subalpine;" in flower and fruit, connecting the small-leaved form with the ordinary European plant. 363. V. CÆSPITOSUM, Michx. 364. ARCTOSTAPHYLOS UVA-URSI, Spreng. 365. GAULTHERIA MYRSINITES, Hook. 366. PYROLA SECUNDA, L. 367. P. ROTUNDIFOLIA, L., var. *uliginosa*, Gray. 368. P. CHLORANTHA, Swartz; a small form. 369. P. (MONESES) UNIFLORA, L. 370. KALMIA GLAUCA, L., the very dwarf form from the "high alpine" region. 371. PTEROSPORA ANDROMEDEA, Nutt.

PLANTAGINACEÆ.

372. PLANTAGO ERIOPODA, Torr. (For the synonymy, see Proceed. Amer. Acad., 6, p. 55, note.) 373. Apparently the same species, with hardly any wool at the crown,—which happens in other species. "High alpine, near perpetual snow." 374. P. PATAGONICA, Lam., var. *gnaphalioides*, Gray.

PRIMULACEÆ.

375. ANDROSACE FILIFORMIS, Retz. "Subalpine; not rare."* 376. A. SEPTENTRIONALIS, L. "Below the subalpine region and also alpine."† 377. A. OCCIDENTALIS, Nutt. "On the plains." 202. A. CHAMÆJASME, L. (*A. carinata*, Torr.) High alpine on Pike's Peak, where Dr. James collected it. 378. PRIMULA FARINOSA, L., var. foliis sessilibus; umbella capitata; calyce cylindraceo tubum corollæ subæquante. *P. dealbata*, Engelm. in litt. But it exactly accords with the left-hand figure of *P. farinosa*, var. *Magellanica* of Hooker's Flora Antarctica (*P. decipiens*, Duby), and with my Antarctic specimens, except that the calyx is perhaps a little longer, and the corolla bluish-purple. Mr. Burke collected the same form on the Rocky Mountains farther north, but with the tube of the corolla a little exserted. Bourgeau collected specimens in the Saskatchawan district, having this elongated calyx-tube along with pedicels of ordinary length. It is interesting thus to connect the Antarctic with the northern forms, by specimens from the Rocky Mountains in about lat. 40°. 379. P. PARRYI, Gray, Enum. Pl. Parry, No. 311. "Alpine and subalpine; common." This holds its characters, except that the specimens of 1862 are generally less luxuriant, and the divisions of the corolla less bifid; indeed, in some of those of Dr. Parry's later collection they are barely emarginate; and in a few of them the calyx is very little glandular, and its lobes are ovate-lanceolate. The longer pedicels of the umbel are 1½ to 2 inches, or in fruit even 3½ inches, in length. Capsule short-ovid, half an inch long, slightly shorter than the calyx-lobes. The thick root is said by Dr. Parry to be very

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* *Androsace filiformis*, Retz., a Siberian species, of which beautiful specimens are in the collection, is now first recorded as of the American flora. It has, however, long since been collected in the Rocky Mountains by Fremont, in his first expedition (in whose report it was wrongly named *A. occidentalis*, Nutt.); by Burke (ex. Herb. Hook.); and more recently by H. Engelmann, in whose collection it was mistaken for *A. septentrionalis*. From the latter, beyond the characters assigned by authors, it is well distinguished by its almost hemispherical calyx, scarcely if at all angled, and with short and flat, not foliaceous teeth.

† Dr. Parry's 313 a of 1862, is the high alpine form of this.

fragrant. Seeds of this handsome Primrose were copiously collected, from which we may hope to have the plant in cultivation. 380. P. ANGUSTIFOLIA, Torr. 381. DODECATHEON MEADIA, L., the same form as Parry's 312. 382. LYSIMACHIA CILIATA, L. "Mountains at medium height." 60 and 577. GLAUX MARITIMA, *L.*, in flower and in fruit.

LENTIBULARIACEÆ.

580. UTRICULARIA VULGARIS, L.? Without flowers. In a subalpine lake.

OROBANCHACEÆ.

383. APHYLLON FASCICULATUM, Torr. and Gray.

SCROPHULARIACEÆ.

384. PENTSTEMON GLABER, Pursh; same as Parry's 260. 385. P. ACUMINATUS, Dougl., agreeing with Bentham's character "filamento sterili glabro," which is very rarely the case, but a very narrow-leaved variety, just *P. secundiflorus*, Benth., excepting the glabrous sterile filament. "Mountains at low and middle elevations." 386. P. ACUMINATUS, Dougl., the ordinary form of the region (*P. nitidus*, Dougl., *P. Fendleri*, Gray), Parry's 258. 390. P. ACUMINATUS, Dougl., in some sets the common broad-leaved form, in others a variety with still narrower leaves than Parry's 264, i. e., a form almost exactly passing into *P. cæruleus*, Nutt., the name which may probably have to be adopted for the combined species. "Plains: May." 387. P. HUMILIS, Nutt., taller than Parry's 257, much larger than Nuttall's specimen. "Low mountains, an early and pretty species." Dr. Lyall has recently collected it in lat. 49°, at the elevation of 7000 feet. 388. P. HALLII, n. sp., described in "Revision of Genus Pentstemon," in Proceed. Amer. Acad. 6, p. 70,—which memoir see for remarks on most of these Pentstemons. This is a most beautiful dwarf species, "not uncommon in the alpine region, descending into the subalpine," the rich blue purple flowers large for the size of the plant. Dr. Parry must have overlooked it in 1861 by confounding it with his 259 (*P. glaber*, var. *alpinus*,) which, externally, it much resembles, but its affinities are with a different group. 389. P. ALBIDUS, Nutt. "Plains: flowers white." 391. P. CONFERTUS, Dougl., var. *purpureo-cæruleus*, Gray, Rev. Penst. (*P. procerus*, Dougl.) A taller form of this, with large radical leaves, was sparingly gathered by Dr. Parry in the Middle Park. 392. P. GLAUCUS, Graham? var. *stenosepalus*, Gray, Rev. Penst. p. 70; the No. 262 of Parry. "South Park and Pike's Peak; alpine and subalpine." 393. P. CÆSPITOSUS, Nutt., Gray, Rev. l. c., p. 66. "South Park, at middle elevations." "Near the Upper Platte, first found by Mr. J. Harbour." Parry. A neat and very dwarf species, named by Nuttall, but unpublished, having been confounded with *P. pumilus*. 394. P. PUBESCENS, Soland., var. *gracilis*, Gray, l. c. *P. gracilis*, Nutt. 395. P. BARBATUS, Nutt., var. *Torreyi*, Gray. 396. P. HARBOURII, n. sp., Gray, Rev. Penst. p. 71. "Mount Breckenridge on Blue River, west of the main range, in the high alpine region near perpetual snow." A very distinct and dwarf species, named after its discoverer. 397. CHIONOPHILA JAMESII, Benth. High alpine, Pike's Peak, &c. Ripe seed having been collected, we may hope that this most rare and interesting plant may become known in cultivation.

398. MIMULUS LUTEUS, L.* 399. M. JAMESII, Torr., var. *Fremontii*, Benth.: apparently a form of *M. glabratus*, HBK. 400. M. FLORIBUNDUS, Dougl. 401. M. RUBELLUS, Gray in Bot. Mex. Bound. p. 116: but the limb of the corolla apparently yellow. "Subalpine: scarce." The same plant occurs in Dr. Lyall's collection on our northwestern boundary, from the Cascade

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* M. LUTEUS, L. var. ALPINUS: caulibus 3-polliearibus e basi decumbente vel reperte 1-3-floris: foliis plerisque sessilibus subintegerrimis. Alpine region, 135*a* coll. Parry. 1862. Very glabrous. Farther north, Dr. Lyall collected a similar, but puberulent and smaller-leaved variety.

Mountains. 402. COLLINSIA PARVIFOLRA, Nutt. 80. LIMOSELLA AQUATICA, L. Apparently just the European plant. "Low mountains." (403, 404. See Polemoniaceæ.)

405. SYNTHYRIS PLANTAGINEA, Benth. Parry's 254, with a little P. ALPINA, Gray, Parry's 255.* 406. VERONICA SERPYLLIFOLIA, L., an elongated form. 407. V. ALPINA, L. 408. V. AMERICANA, Schweinitz.

409. CASTILLEIA BREVIFLORA, Gray, Enum. Pl. Parry, No. 243, and p. (338) 45. *Euchroma*, Nutt. "High alpine." 410. C. INTEGRA, Gray. 411. C. PALLIDA, var. *miniata*, Kunth., Gray, l. c., (often with laciniate leaves,) with a dwarf form of *C. pallida* having purple bracts, Parry's 239 † 412. C. PALLIDA, the *C. septentrionalis*, Lindl. 413. ORTHOCARPUS LUTEUS, Nutt. 414. PEDICULARIS RACEMOSA, Benth. "Subalpine; common in pine woods." 415. P. CRENULATA, Benth., in DC. Prodr. "Subalpine and alpine, South Park." This species was known only from very poor specimens collected by Fremont. These are good ones, but of a more dwarf and alpine form; stems only 6 to 9 inches high, glabrate, except some decurrent lines of pubescence: the leaves smaller and narrower. Corolla in the dried specimens of a deep violet-purple. 416. P. CANADENSIS, L. "In the mountains of middle elevation;" not before known in this region. 417. P. BRACTEOSA, Benth. 418. P. PROCERA, Gray, Enum. Pl. Parry, No. 252. 419. P. GRENLANDICA, Retz. *P. surrecta*, Benth., varying from 4 to 16 inches high, and also in the length of the beak. 420. P. PARRYI, Gray. Pl. Parry, No. 251. 421. P. SUDETICA, Willd. var. Like the specimens of the preceding year; and Dr. Parry also collected a more dwarf state. "Flowers red." 422. RHINANTHUS CRISTA-GALLI, L., var. *minor*.

LABIATÆ.

423. HEDEOMA HISPIDA, Pursh. 424. H. DRUMMONDII, Benth. 425. MENTHA CANADENSIS, L., var. *glabrata*. 426. SALVIA TRICHOSTEMOIDES, Pursh. Probably a form of *S. lanceolata*, for which Bentham takes it. 427. S. PITCHERI, Torr. 428. MONARDA ARISTATA, Nutt. 429. LOPHANTHUS ANISATUS, Benth. 430. DRACOCEPHALUM PARVIFLORUM, Nutt. 431. SCUTELLARIA RESINOSA, Torr.: pubescent and glabrate forms. 432. S. GALERICULATA, L.

BORRAGINACÆ.

433. ECHINOSPERMUM REDOWSKII, Lehm., and a depauperate, diffuse or procumbent form of ERITRICHIUM CALIFORNICUM, DC. 434. ERITRICHIUM CRASSISEPALUM, Torr. and Gr.; the specimens hispid with rough, spreading hairs, and the achenia granulate, and also a more upright and narrower-leaved species, with pointed and smooth achenia, the same as Fendler's 635, named by Torrey *E. nitens*, sp. nov., and afterwards in my herbarium referred to *E. angustifolium*, Torr., which it hardly is. I think it is also *Cryptanthus hispidus*, Nutt., ined. 435. E. JAMESII, Torr. Very well marked by the smooth and acute-angled achenia, the section of each just a quadrant of a circle. 436. HELIOTROPIUM (EUPLOCA, Nutt.,) CONVOLVULACEUM, Gray. 192. H. CURASSAVICUM, L. Doubtless indigenous. 437. ECHINOSPERMUM FLORIBUNDUM, Lehm. 438. ERITRICHIUM GLOMERATUM, DC.; a fine virgate form, like Parry's 258, and a form with shorter and more branched inflorescence. (439, see Hydrophyllaceæ.) 440. E. ARETIOIDES, DC. Beautiful specimens, like those of Parry's 278 in 1861; some of them Aretia-like, and only an inch high; others with elongated flowering stems two inches high. While

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* The latter, from Dr. Parry, in the high alpine region, holds its characters. (The leaves are sometimes rotund-ovate and manifestly cordate.) But a suite of specimens supplied by Mr. Hall shows gradations between the two.

† Parry's 241, from Gray's Parry, collected in the alpine region, is a similar form of *C. affinis*, with a short calyx and white bracts, occasionally parti-colored with white: his 242 a dwarf, pale, alpine form, *C. occidentalis*, Torr.

the scanty remains of the fruit of the former collection were analogous to that of *E. nanum* var. *Terglorense*, DC., well-formed fruit of the present collection is nearly as *E. villosum* is described and figured, having an inflexed margin with ciliate-spinulose teeth, thus lending confirmation to Dr. Hooker's view. And the back is almost as concave as in an *Omphalodes*. It will thus apparently take the name of *E. villosum* var. *aretioides*. 441. LITHOSPERMUM PILOSUM, Nutt.; same as 295 of Parry. 442. MERTENSIA SIBIRICA, Don., non DC. Small form, exactly the *Pulmonaria ciliata*, Torr. Dr. Parry, as before (285), collected large forms, and now some with the leaves more glaucescent beneath. 443. MERTENSIA ALPINA, Don. *Pulmonaria alpina*, Torr. Barely a span high. 444. A very dwarf and hirsute form of the last, the sepals strikingly ciliate with long hirsute hairs, from South Park. These two numbers, and additional still dwarfer specimens of Parry's No. 286, induce me now to refer the latter (along with *M. Drummondii*) to *M. alpina*. 445. M. ALPINA, Don., var.; the loosely paniculate, small-flowered form, Dr. Parry's 284, mixed in my set with M. FENDLERI, Gray, Rev. Mertens., in Suppl. Enum. Pl. Parry, p. 46 (339); the latter, perhaps, runs into the former, but it is readily known by the barely 5-cleft calyx; the lobes only equalling or shorter than the tube.

HYDROPHYLLACEÆ.

439. PHACELIA CIRCINATA, Jacq. 446. P. POPEI, Torr. and Gray. "Flowers white." 447. P. (EUTOCA) SERICEA, Gray.

POLEMONIACEÆ.

448. POLEMONIUM CÆRULEUM, L. A very viscid-pubescent and glandular variety; same as Parry's 275, and, (except that the stem is very leafy to the top,) Geyer's 530, and Fendler's 645. "Low and middle elevations." 449. P. CÆRULEUM, L., answering to the plant of the Old World, except that the seeds are more or less wing-margined at each end; so it is the var.? *pterosperma*, Benth. in DC. "Subalpine, in swampy places." 450, 451. P. CONFERTUM, n. sp.* *P. pulcherrimum* in Enum. Pl. Parry, No. 274, but not of Hook. "High alpine, and at lower elevations." 452. P. PULCHELLUM, Bunge; just the Altai plant; and also accords with some of Hooker's speci-

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* POLEMONIUM CONFERTUM sp. nov.): humile (3–9-pollicare) pl. m. viscoso glandulosum, odorem moschatum redolens: foliolis numerosissimis parvis (1½–5 lin. longis) ovalibus seu lineari-oblongis plerisque irregulariter *verticillato seu fasciculato-confertis* (*nempe singulis* 2-3-*ternis*); floribus ad apicem caulis simplicis capitato-confertis nutantibus; calycis segmentis lanceolatis acutis tubo oblongo brevioribus: *corolla infundibuliformi* (sæpius pollicari) calycem bis terve superante, lobis rotundatis tubo 2-3-plo brevioribus. Var. α. (*P. pulcherrimum*, Gray, Enum. Pl. Parry, non Hook.): capitulo florum denso, fructifero arcte spicato: corollæ læte cæruleæ limbo amplo. Hall and Harbour coll. 450; strictly alpine. Var. β. MELLITUM: floribus in spicam laxiorem foliosum digestis nunc subpaniculatis odorem mellis spirantibus: corolla aut cærulea aut sæpius glaucescente, lobis minoribus tubo productiore 2–4-plo brevioribus. In crevices of rocks, wholly below the alpine region. Leaves exaling the musky odor of var. α; the flowers with a delicious honey-like fragrance. Hall and Harbour, coll. 451. In the present condition of the species of *Polemonium*, I could not venture to add another to the list, if the present were not shown, by the fine suite of specimens now collected, to be a most distinct one. It is probably (at least in the var. α) the very handsomest of the genus; and, as ripe seeds were collected, it may be brought into cultivation. I cannot doubt that the two varieties are of one species. The ampler limb of the corolla of var. α, when fully expanded sometimes ten or eleven lines in diameter, often renders the funnel-form tube less conspicuous; but this form passes by gradations into those of var. β, in which the narrow tube of the corolla (9 or 10 lines long) three or four times exceeds the smaller lobes. In fact, this connects *Polemonium* as closely with *Ipomopsis* as the latter is connected with true *Gilia*. A high alpine form of var. α was collected by Dr. Lyall in the Rocky Mountains farther north, lat. 49°, at the height of 8000 feet, having the verticillate leaflets of the species, but a less exserted corolla. It was taken for *P. viscosum*, Nutt.: but the minute leaflets of the latter are not verticillate or fascicled, although much crowded, and its calyx and corolla are quite different, allying it to *P. pulchellum*. I make small account of the ovules, finding them to vary widely in number in different flowers of the same inflorescence; but in var. α, I have counted a dozen in each cell, in var. β, usually only 4 to 6. The anthers are more oblong than in *P. cæruleum*. Beware of the change of shape which the effete anthers undergo: when dry, they are short-oval, when soaked they become elongated-oblong, as *P. Richardsonii* is figured in Bot. Mag. In like manner those of *P. cæruleum* change from rotund to short-oblong.

mens of *P. pulcherrimum*; both of which, with *P. capitatum*, etc., do seem to pass into Arctic forms of *P. cæruleum*. 453. PHLOX DOUGLASII, Hook. 454. P. HUMILIS, Dougl.? 455. P. HOODII, Richardson. 403. COLLOMIA GRACILIS, Dougl. 404. C. LINEARIS, Nutt. 456. GILIA PINNATIFIDA, Nutt. ined. 457. G. INCONSPICUA, Dougl. 458. G. LONGIFLORA, Benth. (*Cantua longiflora*, Torr.) 459. G. AGGREGATA, Spreng. (*G. pulchella*, Dougl.) With white as well as red flowers. 460. G. SPICATA, Nutt., in Pl. Gamb. The same as 271 of Parry's collection. 461. G. CONGESTA, Hook, var.? with the leaves mostly entire. "Alpine." 462. *Chamærhodos erecta*. See Rosaceæ.) 463. GILIA (LEPTODACTYLON) PUNGENS, Benth., from which *G. Hookeri* scarcely if at all differs.

CONVOLVULACEÆ.

464. CUSCUTA ARVENSIS, Beyrich, var. *pentagona*, Engelm., a form with a small calyx. 579. EVOLVULUS ARGENTEUS, Pursh.

SOLANACEÆ.

465. SOLANUM ROSTRATUM, Dun. 466. PHYSALIS LOBATA, Torr., a form with the leaves little lobed; the corolla purple or blue. 467. SOLANUM TRIFLORUM, Nutt.

GENTIANACEÆ.

468, 469. GENTIANA AFFINIS, Griseb.;* the former a more condensed form; the latter is 439 of Parry's separate collection. "Common in the subalpine region." 470. G. PARRYI, Engelm.†, a form with narrower leaves than Dr. Parry's specimens of the preceding year. "Subalpine." 471. G. DETONSA, Griseb., which Dr. Engelmann, with reason, reduces to a variety of *G. crinita*.‡ 472. G. FRIGIDA, Hænke, var. *algida*, Griseb.: most beautiful specimens of Parry's 305, so new to this country. 473. G. ACUTA, Michx.; in various forms; perhaps in some sets with a little of the too nearly related *G. tenuis*.§ 474. G. HUMILIS, Stev. 475. G. PROSTRATA, var. *Americana*, Engelm. 476. SWERTIA PERENNIS, L. 477. PLEUROGYNE ROTATA, Griseb.‖ "South Park, subalpine." 553. FRASERA SPECIOSA, Dougl.

ASCLEPIADEÆ.

478. ASCLEPIAS BRACHYSTEPHANA, Torr.; a dwarf form of this rare species, collected on the plains. 479. A. SPECIOSA, Torr. (*A. Douglasii*, Hook.)

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* GENTIANA AFFINIS, Gris. *genuina*: caule virescente; bracteis calycem fere æquantibus: calycis lobis inæqualibus tubum longiorem integrum seu varius spathacæo-fissum subæquantibus; corolla anguste clavata pallide cœrulescente.

GENTIANA AFFINIS, var. *brachycalyx*: caule purpurascente; bracteis florum superiorum brevissimis; calycis tubo abbreviato truncato seu brevissime dentato lobatove; corolla majore subventricosa azurea.

This form has the appearance of a distinct species, but the characters taken from the calyx are variable; besides, Dr. Parry has sent specimens of it with a more distinctly lobed calyx. Other specimens collected by Mr. H. Engelmann, on Sweet-Water River, have either an entire or a semispathaceous calyx, with lobes of different proportions: his specimens show many ascending stems growing from a large root, with numerous yellowish fleshy fibres.—*G. Engelmann.*

† GENTIANA PARRYI, Eng., a narrow-leaved form. Dr. Parry informs me that the narrow-leaved varieties are often one-flowered, and their stems single, while the broader-leaved form (coll. Parry, 1861, No. 304) usually occurs in bunches; the boat-shaped bracts, the small calyx lobes, and the bifid folds of the corolla are never wanting, and distinguish it readily from the allied *G. calycosa*.—*G. E.*

‡ GENTIANA BARBELLATA, Engelm. in Trans. Acad. St. Louis, 2, t. 11 (ined.), is Dr. Parry's 440, a truly alpine, dwarf and very beautiful species, closely related to *G. crinita*, *ciliata*, &c.

§ On examination of a series of specimens, Dr. Engelmann is inclined to view *G. tenuis*, Griseb. as an extreme form of *G. acuta*, and also to adopt the conclusions of those who regard the latter as specifically identical with *G. Amarella* of the Old World. He adds the following note.

GENTIANA ACUTA, Michx. Undoubtedly an American subspecies of *G. Amarella*. Messrs. Hall and Harbour have sent a large suite of specimens, which, together with Dr. Parry's (1861, Nos. 307 and 309), show an extreme variability in size, manner of branching and arrangement of flowers, shape and size of leaves, proportion of calyx, size and color of corolla and size of seeds.—*G. Engelmann.*

‖ Dr. Engelmann remarks upon this, 1st. That the ovules cover the whole surface of the ovarian cavity; 2d. That the structure of the corolla is that of *Swertia*, the nectarian glands at the base of the segments of the corolla being surrounded by a petaloid funnel with fringed edges; so that the curious lateral stigma principally separates the genus from *Swertia*.

"On low mountains." 480. A. OVALIFOLIA, Decaisne, Gray, Man., 1862, var. 481. A. VERTICILLATA, L., a common dwarf variety of the region, only three or four inches high.

NYCTAGINACEÆ.

482. OXYBAPHUS ANGUSTIFOLIUS, Sweet; the same as Fendler's 745. 483. O. NYCTAGINEUS, Sweet, with the upper leaves nearly sessile; both glabrous and hirsute forms. 572. ABRONIA FRAGRANS, Nutt. 573. A. CYCLOPTERA, Gray.

CHENOPODIACEÆ.

484. OBIONE ARGENTEA, Moq. The same as 574 of Wright, and 708 of Fendler. 485. CHENOPODIUM HYBRIDUM, L. "Low mountains; rare." 486. MONOLEPIS NUTTALLIANA, Moq. (487. See Amarantaceæ.) 488. CHENOPODINA DEPRESSA, perhaps also *C. prostrata*, Moq. "South Park, and on the plains." The root is annual. 489. C. MARITIMA, var. *erecta*, Moq. 308. OBIONE CANESCENS, Moq.

AMARANTACEÆ.

487. FRŒLICHIA (OPLOTHECA, Nutt.) FLORIDANA, Moq. "Sand hills, on the plains."*

POLYGONACEÆ.

490. POLYGONUM BISTORTA, L., var. *oblongifolium*, Meisn. 491. P. VIVIPARUM, L. 492. P. TENUE, Michx., in several varieties, one of them (Parry's No. 322*a* of 1862) from the alpine region, only two or three inches high, with oblong or oblong-lanceolate leaves, appears to be to *P. tenue* what *P. aviculare*, var. *nanum*, Boiss., is to the ordinary *P. aviculare*.† 493. P. COARCTATUM, Dougl., var. *minus*, Meisn.; a depauperate form? "Blue River, on the western slope of the Rocky Mountains." 494. OXYRIA DIGYNA, R. Br. 495. RUMEX VENOSUS, Pursh. 496, 498. R. SALICIFOLIUS, Weinm. 497. R. MARITIMUS, L. "Subalpine, and on the plains of Nebraska." 499. R. LONGIFOLIUS, DC. (*R. Hippolapathum* and *R. domesticus*, Fries. Extends into the mountains; very common. 500. ERIOGONUM ALATUM, Torr. 501. E. ANNUUM, Nutt. 502. E. EFFUSUM, Nutt., with rose-colored flowers. 503. E. CERNUUM, Nutt. 504. E. UMBELLATUM, Torr., both with straw-colored (Parry's 318,) and with deep yellow flowers (Parry's 315). 505. E. FLAVUM, Nutt., a low form from the alpine region, and a large variety (var. *crassifolium*, Benth.) from a less elevated region.

ELÆAGNACEÆ.

506. SHEPHERDIA CANADENSIS, Nutt. "Subalpine pine woods."

SANTALACEÆ.

507. COMANDRA PALLIDA, var. *angustifolia*, A. DC. *C. angustifolia*, Nutt., ined.

LORANTHACEÆ.

574. ARCEUTHOBIUM CAMPYLOPODUM, Engelm. Probably only *A. Americanum*, Nutt.

EUPHORBIACEÆ.

508. EUPHORBIA MARGINATA, Pursh. 509, (also 438 of Parry) E. MONTANA, Engelm. 510. E. DICTYOSPERMA, Fisch. and Mey. 511. E. HEXAGONA, Nutt.

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* On the plains, in similar situations, Mr. Hall collected *Ambiogyne (Surratia) Torreyi*, Gray, in Proceed. Amer. Acad., 5, p. 169, the narrow form, noted in H. Engelmann's collection. Parry's No 323, referred doubtfully to *Montelia*, is probably the male of this.

† Dr. Engelmann, in a letter, referring all the forms of No. 492 to *P. tenue*, arranges them as follows:—"Var. α. COMMUNE: majus: nucibus majoribus (sesquilineam longis). β. MICROSPERMUM: minus, gracilius; nucibus vix lineam longis. γ. LATIFOLIUM: humile; foliis oblongis; spicis coarctatis; bracteis superioribus (aristo destitutis) muticis. Meisner, in the Prodromus, is wrong in saying that the nuts are subopaque or rough on the edge: they are perfectly smooth and shining with concave sides and an acumination."

512. E. PETALOIDEA, Engelm., with the small-flowered form named *E. polyclada* by Boissier. 513. E. FENDLERI, Torr. and Gray; the inappendiculate form. 514. CROTON (HENDECANDRA) MURICATUM, Nutt. 309. TRAGIA RAMOSA, Torr.

CUPULIFERÆ.

515. QUERCUS DOUGLASII, var. *Neo-Mexicana*, A. DC. 516. CORYLUS ROSTRATA, Ait.

BETULACEÆ.

517. BETULA GLANDULOSA, Michx. "Subalpine." 518. B. PAPYRACEA, Michx., var., called *B. alba*, var. *glutinosa* in Parry's Enumeration. 519. ALNUS VIRIDIS, Ait.

SALICACEÆ.

520. SALIX ARCTICA, R. Br. 521. S. RETICULATA, L. This and the last are high alpine species. 522. S. ROSTRATA, Richards. (*S. vagans*, Anders.) 523. S. GLAUCA, L. "Subalpine." 524. S. CORDATA, Muhl., or VITELLINA, L. 525. POPULUS ANGUSTIFOLIA, Torr. "Foot of the mountains." 526. P. BALSAMIFERA, L., var. *candicans*. "Subalpine; rather rare." 527. P. TREMULOIDES, Michx.

CONIFERÆ.

528. PINUS PONDEROSA, Dougl.; Engelm. in Enum. Pl. Parry, Suppl., p. (39) 332. 529. P. FLEXILIS, James; Engelm., l. c. 530. P. ARISTATA, Engelm. l. c. 531. P. CONTORTA, Dougl.; Engelm., l. c. 532. P. EDULIS, Engelm. 533. ABIES MENZIESII, Lindl. 534. A. DOUGLASII, Lindl.

ORCHIDACEÆ.

535. PLATANTHERA HYPERBOREA, Lindl. 536. P. OBTUSATA, Lindl. 537. CALYPSO BOREALIS, Salisb. 538. CYPRIPEDIUM PARVIFLORUM, Salisb. 539. SPIRANTHES GEMMIPARA, Lindl., from South Park, in the Rocky Mountains, (and one or two specimens were collected by Dr. Parry on South Clear Creek, July, No. 441);—quite resembling the Irish plant in aspect and in the labellum, etc., but the sepals rather narrower and less blunt,—mixed (in my set) with taller specimens, from the plains, of a narrow-leaved form of S. CERNUA, having very large nipple-shaped calli on the base of the labellum. The labellum of the former, when flattened out, is in outline ovate or ovate-oblong, with a narrowed subapical portion below the cordate-rotund erose-crisped summit. The forms of *S. cernua*, or the species allied to it, are thus far quite inextricable. The present Rocky Mountain specimens are exceedingly interesting, whether absolutely identical or not with the much-vexed and isolated *S. gemmipara*. They have not the long-acuminate bracts of *S. Romanzoviana*, of which my specimens are too young to allow a comparison of the flowers.

ALISMACEÆ.

540. TRIGLOCHIN PALUSTRE, L. 541. T. MARITIMUM, L. Both from the mountains.

IRIDACEÆ.

542. IRIS TENAX, Dougl.? "Subalpine, and at lower elevations; common." This, now collected in flower, we had in fruit, collected on the Laramie Mountains by Dr. Hayden, and at Bridger's Pass by Mr. H. Engelmann. The spathe is more scarious and the capsules larger than in *I. tenax*.

LILIACEÆ, incl. SMILACEÆ, MELANTHACEÆ, etc.

543. STREPTOPUS AMPLEXIFOLIUS, DC. 544. SMILACINA STELLATA, Desf. 545. ALLIUM STELLATUM, Fraser. 546. A. SCHŒNOPRASUM, L. 547. A. CERNUUM, Roth. 548. LEUCOCRINUM MONTANUM, Nutt. 549. CALOCHORTUS VENUS-

TUS, Benth. ex Torr. 550. ZYGADENUS GLAUCUS, Nutt. 551. AMIANTHIUM NUTTALLII, Gray. 552. LLOYDIA SEROTINA, Reich. "Pike's Peak, in the alpine region." (553. See Gentianaceæ.)

JUNCACEÆ.

554. LUZULA SPICATA, DC., var. near *L. Peruviana*; the same as 392 of Dr. Parry. 555. L. PARVIFLORA, DC. 556. L. COMOSA, E. Meyer (with a little *L. campestris*). 557. JUNCUS TRIGLUMIS, L. 558. J. ARTICULATUS, L., var. *pelocarpus*, Gray, Man. 559. J. BUFONIUS, L. "Subalpine." 560. J. CASTANEUS, Sm., an alpine form, the same as Parry's 358. 561, 562. J. ARCTICUS, Willd., var. *gracilis*, Hook.? Alpine and subalpine. The same as Parry's 360. It appears like a depauperate and attenuated form of *J. arcticus*: but as most of the cauline sheaths are leaf-bearing, it is probably of a distinct species, so far as I know, yet undescribed. Dr. Lyall collected it, as well as the true *J. arcticus*, in the Cascade Mountains, farther north. 563. J. ARCTICUS, Willd., proper, with leafless sheaths and more less attenuated stems. 564. J. XIPHIOIDES, E. Meyer. Well marked by its flattened stems as well as leaves. It was also collected in this region by Fendler (858), H. Engelmann, and in the Rocky Mountains, farther north, by Bourgeau. 565. J. ENSIFOLIUS, Wikstr. This has "terete flaccid culms." 566. J. MENZIESII, R. Br.: the same as Parry's 361 so named, Fendler's 857, Wright's 1924, and Coulter's 808, the var. *Californicus*, Hook. and Arn. Probably an unpublished species. 567. J. BALTICUS, Willd.

568—580. Various Dicotyledonous plants, enumerated above under their respective orders.

CYPERACEÆ.

581. FIMBRISTYLIS LAXA, Vahl. 582. SCIRPUS PAUCIFLORUS, Lightf., which Drummond had formerly collected in the Rocky Mountains, and which has been detected at several points along the northern frontier of the United States. 583. S. CÆSPITOSUS, L. Also subalpine. 584. CYPERUS SCHWEINITZII, Torr. "Low mountains, lat. 39°."

585—620. *Carices* here given from the determination and notes of Dr. Boott:—

585. CAREX ATRATA, L. (OVATA): spicis 3 oblongis (inferioribus pedunculatis parce masculis) atro-purpureis; perigyniis floriferis glauco-viridibus. 586. C. ATRATA: spicis contiguis ovatis crassis, inferiori subsessili; perigyniis floriferis margine viridibus squamis atropurpureis demum-ferrugineis subæquilongis. Vide Parry, 389. 577. C. ATRATA (NIGRA): spicis subrotundis congestis vel infima discreta sessilibus; perigyniis ovalibus vel ellipticis cylindrico-rostratis superne præcipue ad margines rostri dentatis; stig. 2-3. Gracilior, altior quam pl. Helvetica rostroque longiore, perigyniis pallidis. Eadem ac Parry, 383. 588. C. ATRATA, L. and C. RIGIDA, Good., mixed. 589. CAREX FESTIVA, Dewey. 590. C. FESTIVA, Dewey; young.

591. CAREX BONPLANDII, Kunth.? var. *minor*: perigyniis rarissime ad margines scabris. See Couthouy's specimens from the Andes of Quito.

592. CAREX MURICATA, L.? with smaller perigynia, like Fendler's No. 884, in part. 593. C. SICCATA, Dewey. 594. C. DISTICHA, Huds. (*C. Sartwellii*, Dewey.) 595. C. GAYANA, Desv., Boott, Ill., t. 411. 596. C. DEWEYANA Schw. 597. C. STENOPHYLLA, Wahl.

598, 599. KOBRESIA SCIRPINA, Willd., or perhaps with some K. CARICINA, Willd.

600. CAREX DOUGLASII, Boott. Here, as in all other collections, in flower only. 601. C. TENELLA, Schk. 602. C. CANESCENS, L. 603. C. POLYTRICHOIDES, Muhl.

604. CAREX FILIFOLIA, Nutt., var. culmo validiori; perigyniis plano-triquetris glabris margine serrulatis; squamis minus late scariosis; rhacheola ut in

forma typica. 605. C. FILIFOLIA, Nutt.; the ordinary form. [Parry's 442 is a high alpine form of the same species.]

606. CAREX OBTUSATA, Lil. 607. C. PAUCIFLORA, Lightf. 608. C. PYRENAICA, Wahl. 609. C. NIGRICANS, C. A. Meyer. 610. C. SCIRPOIDEA, Michx. 611. C. GEYERI, Boott. 612. C. BACKII, Boott. 613. C. CAPILLARIS, L.

614. CAREX LONGIROSTRIS, Torr., var. *minor*; culmo brevi; spicis abbreviatis: rostro breviore. 615. C. AMPULLACEA, L. (*utriculata*, Boott.) 616. C. JAMESII, Torr. and C. ANGUSTATA, Boott, mixed. 617. C. PARRYANA, Dewey. Some specimens have two spikes, the terminal masculine; others have either one or two spikes, both wholly feminine. 618. C. ALPINA, Sm. (*Vahlii*, Schk.) 619. C. BUXBAUMII, Wahl. 620. C. ROSSII, Boott.

GRAMINEÆ.*

621. An ambiguous and undetermined Grass, between *Festuca* and *Melica*. 622. DANTHONIA SERICEA, Nutt. [*D. unispicata*, Munro, ined., is a reduced form of this, to which belongs Geyer's No. 189.] 623. AVENA STRIATA, Michx. 624. CALAMAGROSTIS SYLVATICA, DC. 625. TRISETUM SUBSPICATUM, Beauv., with a remarkable open-panicled form. 626. STIPA VIRIDULA, Trin., the *S. parviflora*, Nutt. 627. AIRA CÆSPITOSA, L., two forms; the smaller and more alpine of which is the var. *arctica* (*Deschampsia brevifolia*, R. Br.); the larger is intermediate between that and the ordinary form of the species. Parry's 367 of 1862 connects the two.

628. HIEROCHLOA BOREALIS, R. and S. 629. GLYCERIA AQUATICA, Smith. 630. G. (HELEOCHLOA) AIROIDES, Thurb., the *Poa airoides*, Nutt.

631. VILFA TRICHOLEPIS, Torr.; a remarkable species, which it may be necessary upon further study to remove from the genus. 632. MUHLENBERGIA PUNGENS, n. sp.† 633. ERIOCOMA CUSPIDATA, Nutt. 634. ORYZOPSIS MICRANTHA; *Urachne micrantha*, Trin. A very distinct species, differing from *O. Canadensis*, Torr., in its elongated panicle, smaller spikelets, glabrous paleæ, and much longer awn. 635. GRAPHEPHORUM? FLEXUOSUM, n. sp.‡ 636. BOUTELOUA OLIGOSTACHYA Torr. 637. BUCHLŒ DACTYLOIDES, Engelm. (*Ieria*, Nutt.); the staminate plant only. 638. MUNROA SQUARROSA, Torr. 639. SPARTINA GRACILIS, Trin.; the name wrongly attributed to Hooker by Steudel; it is S. JUNCIFORMIS, Engelm. and Gray, Pl. Lindl. 1, No. 207. 640. BRIZOPYRUM SPICATUM, Hook, var. *strictum*.

641. SPOROBOLUS ASPERIFOLIUS, Nees and Meyen. 642. MUHLENBERGIA GRACILLIMA, Torr. 643. SPOROBOLUS RAMULOSUS, HBK. 644. LEPTOCHLOA FASCICULARIS, Gray; a remarkable and large form; which has been by seve-

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* By *Prof. George Thurber*. On account of illness, Prof. Thurber has been prevented from studying these Grasses as thoroughly as could be wished. A more critical account of some of them may be expected hereafter.

† MUHLENBERGIA PUNGENS (Thurber, sp. nov.): culmo e rhizomate repente 1–1½-pedali foliisque rigidis convolutis pungentibus patentibus (1–1½ poll. longis haud lineam latis) minute pubescentibus, ligula brevi ciliata; panicula 3–4-pollicaris radiis solitariis dissitis basi nudis fasciculatim ramosis; pedicellis capillaribus scabris spiculis (cum arista 2½ lin. longis) pluries longioribus; glumis fere æqualibus acuminatis vel seta apiculatis flore dimidio brevioribus; callo nudo rudimento minimo prædito; palea inferiori scabra acuta in aristam asperan[illegible]vel sublineam longam producta, superiori subæquilonga, nervis excurrentibus bisetiferis; staminibus 3.—A striking species, with very pale green foliage, and a purplish panicle. Collected also by Mr. H. Engelmann in Nebraska, and by Dr. J. S. Newberry in Ives' Colorado Expedition.

‡ GRAPHEPHORUM? FLEXUOSUM (Thurber, sp. nov.): culmo tripedali lævi; vaginis internodia superantibus annulo pilorum pro ligula instructis; foliis sesquipedalibus 2 lin. latis setaceo-acuminatis; panicula laxiflora, radiis sparsis (infimis distantibus circ. 4 poll. longis) inferne nudis in ramulos paucos capillares solutis; pedicellis spiculis ovatis compressis 3–6-floris) 2½–3 lin. longis) duplo vel quadruplo longioribus; glumis membranaceis uninerviis acutis spicula dimidio brevioribus; palea inferiori carinata trinervi (nervis lateralibus prominentibus) scabro-pubescente apice eroso-denticulata cum mucrone basi villifera, superiori subæquilonga eximie bicarinata bidentata. Stam. 3. Ovarium stipitatum. Squamulæ 2, oblique truncatæ. Caryopsis libera. Dr. J. M. Bigelow collected this Grass several years ago on the Canadian River. It is doubtfully referred to *Graphephorum* as that genus is defined by Dr. Gray in the Proceedings of the Botanical Society of Canada. But the joints of the rhachis are very short, and the tuft of hairs seems rather to belong to the palea.

ral western collectors, but I am unable to distinguish it specifically from the plant of the Atlantic States. 645. TRICUSPIS PURPUREA, Gray. 646. STIPA MONGOLICA, Turcz. (*Ptilagrostis Mongolica*, Griseb. in Ledeb., Fl. Ross.) I have no specimen by which to confirm this determination, but it accords so well with the description, except as to size, as to leave little doubt.* This makes the third species with a plumose awn found in our territory.

647. SPOROBOLUS AIROIDES, Torr. 648. S. CRYPTANDRUS, Gray, same as 945 of Fendler. 649. CALAMAGROSTIS STRICTA, Trin., with some C. SYLVATICA intermixed. 650. KŒLERIA CRISTATA, Pers., a very attenuated form. 651. ANDROPOGON ARGENTEUS, DC. (*A. Jamesii* and *A. glaucus*, Torr.) 652. ARISTIDA PURPUREA, Nutt.; the form called *A. Fendleriana* by Steudel. 653. PASPALUM SETACEUM, Michx.

654. ELYMUS near CONDENSATUS, Presl. and apparently E. TRITICOIDES, Nutt., mixed. 655. TRITICUM REPENS, L., var. [656. T. CANINUM, L. var., the same as Parry's 381, named *T. ægilopoides* in the coll. of 1861, but wrongly; along with attenuated T. REPENS, L. 657. T. ÆGILOPOIDES, Turcz., *A. gropyrum divergens*, Nees.]

658. BECKMANNIA ERUCÆFORMIS, Host. 659. SPOROBOLUS AIROIDES, Torr. 660. VILFA DEPAUPERATA, Torr. This was described from an extremely reduced form of a very variable species, of which *V. utilis*, Torr., is an attenuated state. 661. V. CUSPIDATA, Torr. Like others of the genus, this presents great differences in the relative length of the glumes and paleæ.

662. GLYCERIA PAUCIFLORA, Presl. 663. CATABROSA AQUATICA, Beauv. 664. MUHLENBERGIA GRACILIS, Trin. 665. FESTUCA OVINA, L., var. *duriuscula*, Gray. 666. F. RUBRA, L.; very young. 667. F. SCABRELLA, Torr.? Perhaps a very narrow-leaved form of this species, of which specimens collected by Dr. Bigelow in New Mexico are the opposite extreme.

668. POA near P. NEMORALIS, L. It is 375 of Parry. 669. P. ANDINA, Nutt. in herb. Acad. The Poas of this collection, including some undistributed specimens, present several puzzling forms, which can be accurately determined only by a much more thorough study than can be given them at present. 670. P. ARCTICA, R. Br., (Parry's 376,) mixed with some of *P. alpina*.

671. AGROSTIS VARIANS, Trin. Agrees well with Hooker's No. 217, quoted by Trinius, but some specimens have a strong awn. 672. POA SEROTINA, Ehrh. 673. AGROSTIS near RUPESTRIS. 674. POA ALPINA, L., mixed with one which may be a variety of it. [675. POA, near 669 and 677.] 676. P. ARCTICA, R. Br.? 677. P. ANDINA, Nutt. 678. POA, undetermined species.

679. SITANION ELYMOIDES, Raf. Two forms of this variable grass, which will probably be reduced to *Elymus*. 680. TRITICIUM CANINUM, L., var. same as 381 of Parry. 681. HORDEUM JUBATUM, L. 682. ALOPECURUS PRATENSIS, var. ALPESTRIS, Wahl. (*A. glaucus*, Less.) ex Gray. 683. A. GENICULATUS, var. ARISTULATUS, Michx. 686. LEPTANS PANICULATUS, Nutt. 685. VASEYA COMATA, n. gen. and sp. This remarkable grass, which really appears to form a new genus, intermediate between the Arundinaceæ and the Agrostideæ, is dedicated (by the collectors' desire, seconded by Dr. Gray) to Dr. George Vasey, of Ringwood, Illinois, one of the most zealous of our Western botanists. The following are its principal characters:

VASEYA, nov. gen.

Panicula coarctata. Spiculæ unifloræ, herbaceo-membranaceæ. Glumæ uninerves florem adæquantes. Callus obliquus, comam pilorum paleis æquilongam gerens. Palea inferior trinervis in aristam gracilem attenuata; superior æquilonga, acuminata. Stamina 3. Ovarium stipitatum. Styli ultra medium pilis stigmaticis longis simplicissimis instructi. Squamulæ . . . Caryopris . . . . V. COMATA, a native of the plains of Nebraska; is a

* A comparison with an authentic but imperfect Mongolian specimen confirms Prof. Thurber's determination.—*A. G.*

684 Phleum alpinum

perennial grass, with the aspect of a *Mulenbergia* or of a *Polypogon*, but with a coma of silky hairs around the flower, as in a *Calamagrostis*. Culm a foot and a half high, from a creeping rhizoma, retrorsely pubescent at the nodes. Sheaths scabrous, equalling the internodes; ligule short, fringed; leaves 3 or 4 inches long, dull green, rough on both sides. Panicle lead-colored, about 3 inches long; the branches solitary, appressed, densely many-flowered. Spikelets very short-pedicelled, compressed, pubescent, a line and a-half long. Glumes narrow, very acute, serrulate on the keel, the lower a little the longer. Awn rough and flexuose, purplish, three or four lines long.—*G. Thurber.*

FILICES.

687. ASPIDIUM FILIX-MAS, Swartz.; apparently identical with the European plant. 688. CRYPTOGRAMME ACROSTICHOIDES, R. Br., by Sir Wm. Hooker regarded as a variety of *Allosorus crispus*. 689. ASPLENIUM SEPTENTRIONALE, L. This was collected by C. Wright farther south; and these two stations are the only known American ones. 690. CYSTOPTERIS FRAGILIS, Bemh., mixed with a WOODSIA, the same as Parry's 394, formerly named *W. obtusa;* but it is of a different species. 691. CHEILANTHES FENDLERI, Hook. 692. ASPLENIUM TRICHOMANES, L. 693. NOTHOCHLÆNA FENDLERI, Kunze, Filices, 2, p. 87, t. 136; the same as Parry's 396. A species recently distinguished from *N. dealbata*. 694. POLYPODIUM VULGARE, L. 695. P. DRYOPTERIS, L.

Catalogue of the FISHES of Lower California, in the Smithsonian Institution, Collected by Mr. J. Xantus.

BY THEODORE GILL.

PART IV.

Subfamily *SERRANINÆ* (Swainson.)

Nine genera of this subfamily are now known to be represented by species along the western coast of America and the Gallapagos Islands. They may be thus distinguished:—

I. Caudal with the lobes acuminate.
  Lateral line before superior, deflected behind..... Pronotogrammus.
  Lateral line normal..... Brachyrhinus.
II. Caudal not forked.
  A. Canine teeth developed.
    B. Dorsal spines XI.
      C Nostrils in a vertical row..... Mycteroperca.
      CC. Nostrils in a longitudinal row.
        Body oblong; smooth above lateral line..... Labroperca.
        Body oval, with ctenoid scales..... Epinephelus.
    BB. Dorsal emarginated; spines X.
      C. Head with profile decurved, scaly above..... Paralabrax.
      CC. Head conic; naked between eyes.
        Spinous dorsal rounded..... Atractoperca.
        Spinous dorsal, incurved behind the third elongated spine..... Gonioperca.
  AA. Canine teeth entirely obsolete ..... Dermatolepis.

The preceding table gives only the more striking characters; those are accompanied by others, which appear to amply authorize their generic distinction. In the table, the genera do not follow each other in a strictly natural order.

Genus PRONOTOGRAMMUS Gill.

This genus has the form of *Brachyrhinus*. The body is covered by moderate,

15 New species discovered by Dr Parry 1861

12. Boltonia latisquama A. Gray
51 Aplopappus Parryi A Gray
52 Senecio cernuus A Gray
56 Senecio amplectens A Gray
96 Draba streptocarpa A Gray
129 Sedum rhodanthum A Gray
142 Oxytonia arctica var? megarhiza A Gr.
158 Cymopterus alpinus A Gr.
178 Trifolium Parryi A Gr
193 Astragalus Parryi A Gr
251 Pedicularis Parryi A Gray
252 Pedicularis procera A Gray
255 Synthyris alpina A Gray
304 Gentiana Parryi Engelm
311 Primula Parryi A Gray
Pinus aristata Engelm
(Abies Lasiocarpa Parry)
(Menziesii Fendleri A Gray)

23 New species by Hall Harbour & Parry 1862

17. Ranunculus adoneus. Gray
49 Vesicaria montana Gray
66 Parrya Nuttallii pulvinata Gray
198 Saxifraga debilis Engelm
(205 bis) Hutchinsia Hallii Gray
215 Thaspium trachypleurum Gray
222 Cymopterus (?) caudatus Gray
256 bis. Aplopappus Lyallii Gray
257 A — corcus Gray
Helianthella Parryi Gray
272 Helenium Hoopesii Gray
293 Linosyris Parryi Gray
297 Artemisia scopulorum Gray
299 Senecio Soldanella Gray
319 S. Harbori Gray
Cirsium eriocephalum Gray
388 Pentstemon Hallii Gr.
396 P — Harbouri Gray
450 Polemonium confertum Gr

over

440 Dam.) Gentiana barbellata Lycia
632 Muhlenbergii pungens Thunb.
635 Gnaphalium flexuosum Thunb.
685 Vieya ornata n. gen Thunb.